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MARCH 4, 1937

ESTABLISHED 1855 Vol. 139, No. 9

When You Evict the Devil, Close the Door!

THIS editorial is not a blanket condemnation of unionism. If it were, we would not publish it. For we believe that unions can and do justify their right to existence as social and economic assets. It is a question of the motivation of their leadership and the degree of intelligence exercised in their management.

As a specific example, we have pleasant and profitable relationships, extending over many years, with the printing crafts unions. They observe contracts to the letter and exert a distinct force in the elevation of craftsmanship.

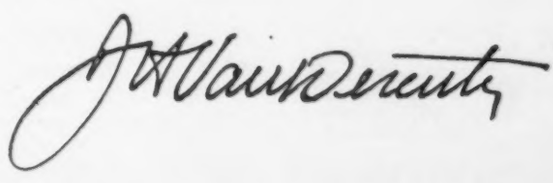
That such unions may have secured for their membership a wage rate commensurate with ability is not, to us, a cause for condemnation but for congratulation. What we do condemn, in present-day unionization effort, is that the monetary returns are not broadly distributed. There is too much opportunity for an unscrupulous organizer to pocket the proceeds.

In the case of the recent glass workers' strike, for example, it is estimated that it will take the workers at least two years at the new wage rates to recoup the losses occasioned by their idle time during the strike. The organizers, however, profit immediately.

Lust for power and profit is not confined to any one class of society. It can be found in the ranks of labor as well as in those of capital. And it exhibits the same ugly earmarks in whatever strata it is found.

Labor today is exposed more to danger of exploitation by its self-appointed leaders than by its employers. To convince yourself of this, read the current disclosures concerning the Cafeteria Workers' Union in New York. If any employer were to rook his workers as ruthlessly as the officials of that union are said to have exploited their membership, he would be burned at the stake of indignant public opinion.

In the present hysteria for turning everything upside down, let us remember the parable of the man who was possessed of the devil. After it was exorcised, seven even more terrible devils moved into the vacated quarters!



Granite City Steel Completes

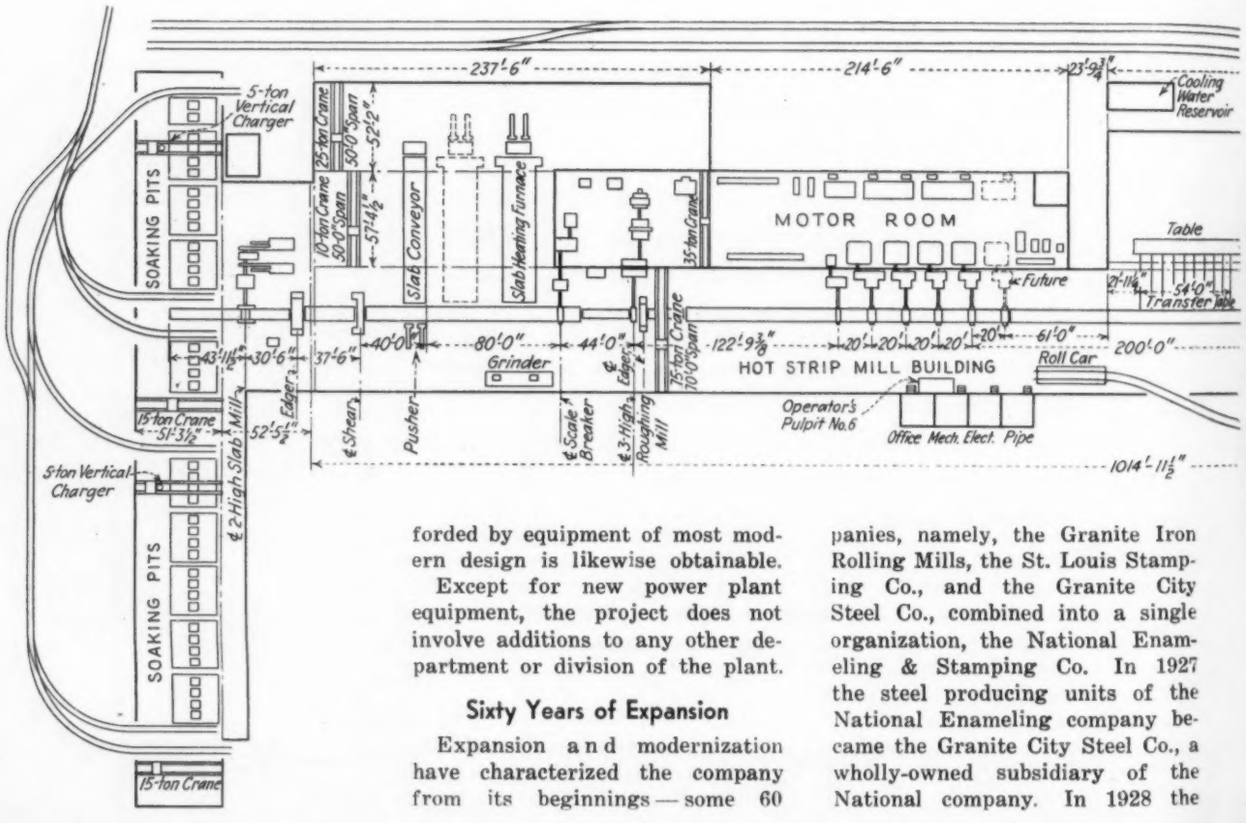
INSTALLATION of a unique continuous 90-in. hot strip mill and of a reversing 48-in. cold strip mill has been completed by the Granite City Steel Co., Granite City, Ill.

In addition to the rolling of strip and sheets up to 84-in. wide and plate of the same width, the hot mill layout, with its 100-in. plate mill, permits rolling of plates over 90 in., which can be transferred and sheared before reaching the four-high finishing stands.

Use of this three-high plate mill, with the flexibility it provides, is one of the unique features of this latest hot strip installation. Together with soaking pits and the 100-in. two-high slabbing mill, this plate mill was taken over from the company's previous plate rolling layout, with a considerable lowering of initial investment in the hot mill as a whole.

Wider diversity of product with the same ingot capacity is made possible by the new continuous mills. In the case of the hot mills there is also a flexibility of changeover and an increase in speed that will greatly facilitate deliveries. Better quality of product through the closer control afforded by equipment of most modern design is likewise obtainable.

Except for new power plant equipment, the project does not involve additions to any other department or division of the plant.



Sixty Years of Expansion

Expansion and modernization have characterized the company from its beginnings — some 60 years ago — as the Granite Iron Rolling Mills, St. Louis, to supply material to the St. Louis Stamping Co., an affiliated organization. In the 13 years from 1878 to 1891 there were a number of plant additions, culminating in 1891 in the purchase of some 2500 acres at what is now Granite City. The Granite City Steel Co. was then organized, and in 1895 a new plant consisting of two 20-ton basic open hearths, a 34-in. bloomer, an 84-in. plate mill, a 60-in. jobbing mill, an 18-in. three-high bar mill and other equipment was put in operation.

In 1898 the three separate companies, namely, the Granite Iron Rolling Mills, the St. Louis Stamping Co., and the Granite City Steel Co., combined into a single organization, the National Enameling & Stamping Co. In 1927 the steel producing units of the National Enameling company became the Granite City Steel Co., a wholly-owned subsidiary of the National company. In 1928 the

Continuous Strip Mill Installation

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By R. E. MILLER

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Granite City Steel Co. was incorporated, and became a separate entity.

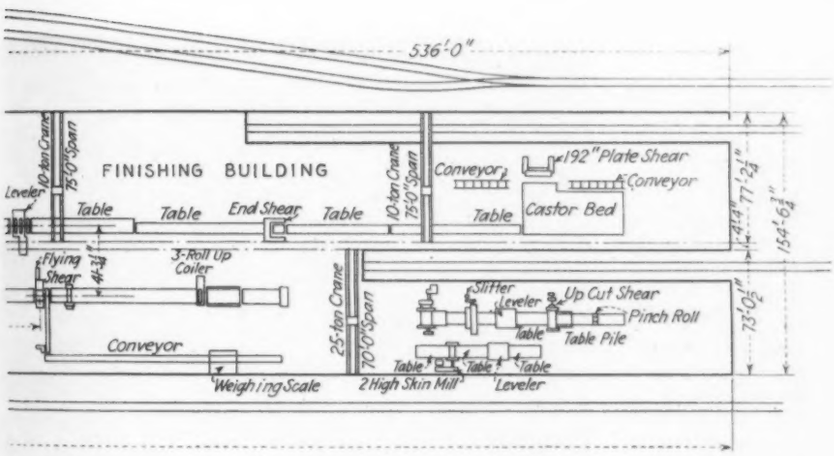
In 1900 six basic open hearths, four 25-ton and two 20-ton, and 16 tin mills with complementary equipment were installed at Granite City, and seven years later a new tin house was added. In the same year, 1907, the company began selling to the general steel consuming trade.

From 1909-1918, the company increased the number of its tin mills to 20, enlarged four of its 40-ton open hearths, installed six new 60-ton open hearths with related equipment, and added an 84-in. two-high reversing plate mill. Subsequent major plant additions included the building in 1923 of the company's 26-acre North Plant equipped with six sheet mills, one 72-in. jobbing mill, and a number of galvanizing pots.

New Hot Strip Mill

The continuous 90-in. hot strip mill that forms the larger part of the company's present expansion project is housed in a building that is about 1100 ft. long. Major units, built for the most part by the United Engineering & Foundry Co., Pittsburgh, are as follows:

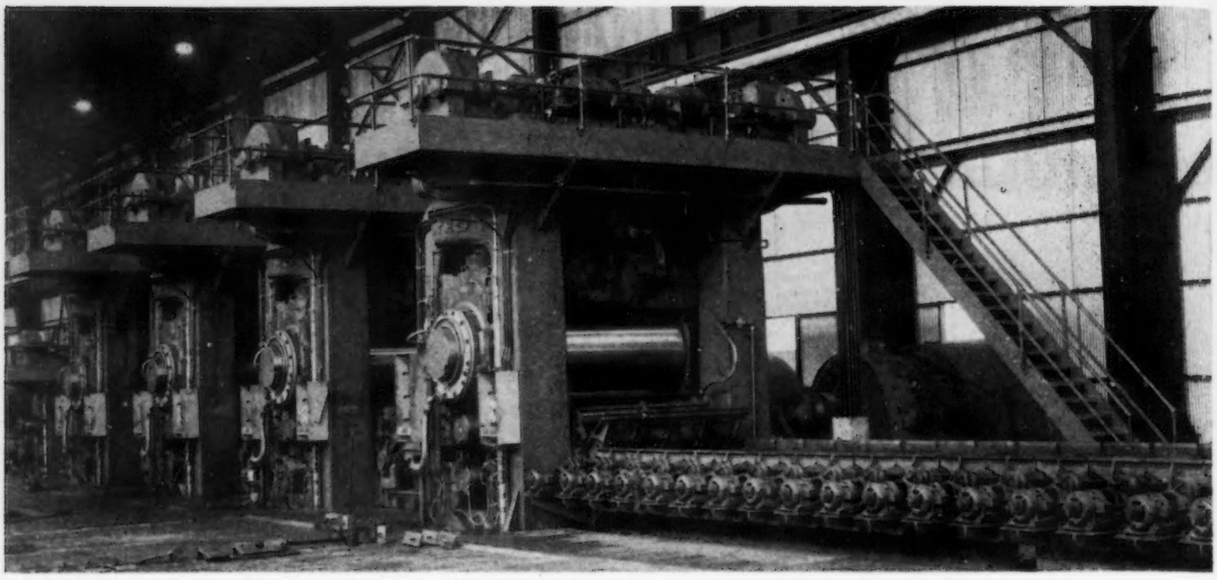
100-in. two-high slabbing mill.
Reversible vertical edger.
900-ton steam-hydraulic up-cut slab shear with gaging table.
Slab conveying, piling and storage facilities.
Continuous slab reheating furnace.
30 x 100 in. two-high roughing scale breaker.
100-in. three-high roughing mill, equipped with vertical edger.
27 x 90 in. two-high finishing scale breaker.
90-in., four-high finishing mill (four stands).
200-ft. runout table.
Hot coiler.
Flying shear.
Sheet piler.
90-in. skin pass mill.
Roller levellers, shears, etc.



GENERAL plan of Granite City Steel Co.'s new 90-in. continuous hot strip mill—one of the largest in the United States.

The 100-in. slabbing mill, the first unit in the rolling line, is equipped with a turntable for use in spreading ingots, and is driven by a twin 36 x 48-in. horizontal reversing steam engine. Located about 30 ft. from it is the vertical edger, driven by a 1000-hp. d.c. motor. Next in line is the 900-ton steam hydraulic up-cut shear, which has capacity for cutting up to 5-in. slabs in lengths ranging from 2 to 15½.

Except in the case of direct rolling of plates, the cut slabs advance about 40 ft. to a pusher that loads them on to an inclined roller conveyor located at right angles to the mill table. This conveyor, a United Palmer-Bee unit, is about 90 ft. long, has



anti-friction bearing rollers, and is motor driven. It leads to a slab piler, from which the slabs are lowered to a platform for chipping, scarfing or other conditioning. Slab storage space of approximately 52 x 238 ft. is provided in a section adjoining this conveyor.

A slab reheating furnace has been installed adjacent to the slab storage. This unit, supplied by the Surface Combustion Co., is of continuous type with a Chapman-Stein tile recuperator, and will burn natural gas. It is 18 ft. wide and 70 ft. long, inside, and will handle slabs 2½ to 6 in. thick, 5 to 7 ft. long, in two rows, or 15-ft.-long slabs in one row, at the rate of 50 gross tons an hour.

Roughing Train

From the furnace the reheated slabs enter the roughing train, the first unit of which is the 30 x 100-in. roughing scale breaker, driven by a 750-hp. motor. Water under 1000-lb. pressure is supplied to the hydraulic descaling nozzles of this and of the subsequent finishing scale breaker and of the three-high roughing mill by a compact installation comprising twin Allis-Chalmers 500-hp. centrifugal pumps with an air-cushioning tank.

The next stand in line, some 44 ft. from the scale breaker, is the three-high, 100-in. roughing mill, equipped with a vertical edger and driven by a 3000-hp. Westinghouse motor with flywheel. It is believed that this is the first time that a three-high mill of this type has been employed in a hot strip layout.

The diameter of the top and bottom rolls of this mill is 34 in. and that of the middle roll 22 in. Ryertex water-cooled roll neck bearings are used and also hydraulic roll balancers employing water at 1000-lb. pressure.

Farval automatic lubrication is used here, as well as elsewhere, wherever desirable. Side guards and screwdowns are Selsyn-equipped so that the setting of these motor-operated units is determined at all times.

Finishing Train

From the roughing mill the strip advances to the finishing scale breaker over an approach table driven by two 30-hp. motors through reduction gears. Approach table speeds may be varied from 0 to 500 ft. per min.

The finishing scale breaker,

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THE finishing train comprises four stands of four-high mills. Work rolls are 26 in. in diameter and backing-up rolls, 53 in.; the latter are carried in Morgoil bearings believed to be the largest yet built. The hot rolled strip leaves the last stand at speeds up to 1200 ft. per min. and advances to an up-coiler over a 200-ft. long, two-section runout table equipped, respectively, with 102 and 16 individual motor-driven rollers.

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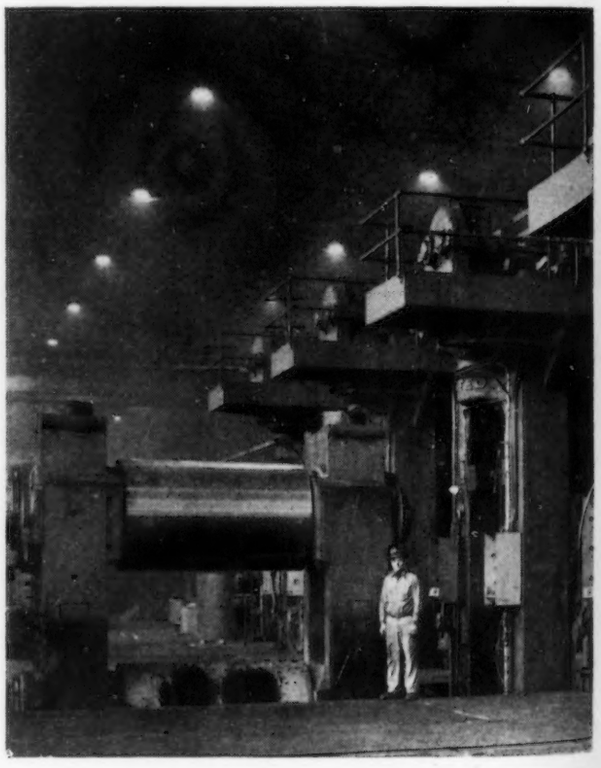
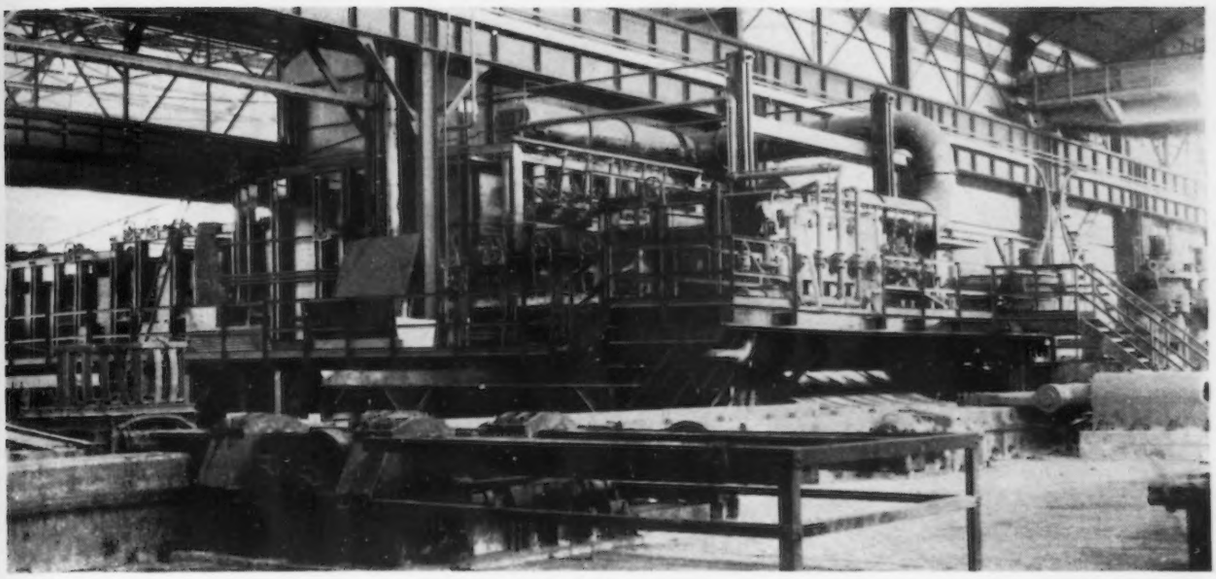
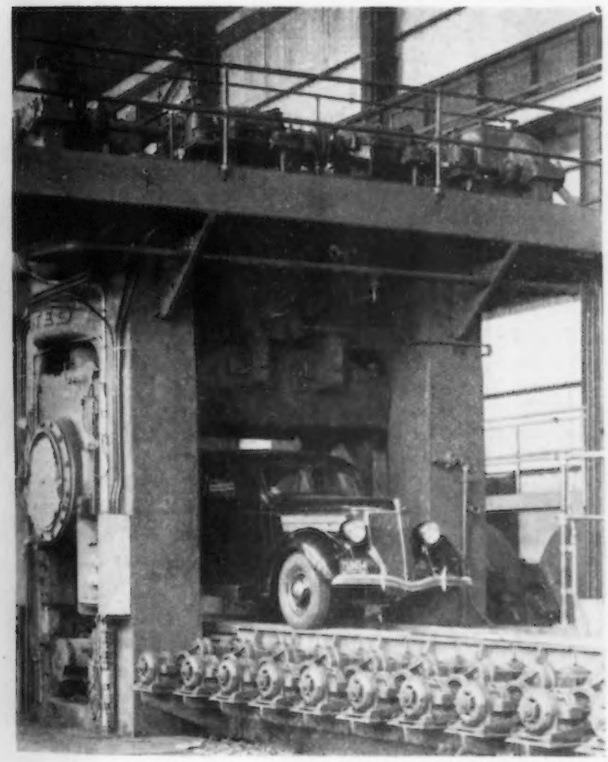




driven by a 350-hp. d.c. motor, is a two-high unit having 27 x 90-in. rolls carried in Ryertex water-cooled bearings. Hydraulic roll balancers, in this case employing oil under high pressure, are used on this mill.

Next in line are four stands of the four-high finishing mill. Each of the first three stands is driven by a 3500-hp. motor and the fourth stand by a 2500-hp. motor—all d.c. Work rolls are 26 x 90-in., and are equipped with Messinger roller bearings. Backing-up rolls are 53 x 90-in. and are carried in Morgoil bearings, believed to be the largest yet built.

Selsyn control devices are provided for indicating roll and chute guide settings, both sides of each stand being so equipped. Indicators are mounted on the mill housings and adjustments made by push-button control. These permit accurate setting of rolls or guide chutes by one man. Another feature of these four-high finishing stands is a roll changing rig that permits changing the top and bottom backing-up rolls simultaneously in about 20 min.



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THE continuous type slab reheating furnace in the hot strip mill is 18 ft. wide and 70 ft. long, inside, and will handle slabs at the rate of 50 gross tons an hour.

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THE four-high finishing stands are provided with a roll-changing rig (at left) that permits changing top and bottom backing-up rolls simultaneously in about 20 min. The Ford sedan between the housings, serves to show the immense size of the finishing stands.

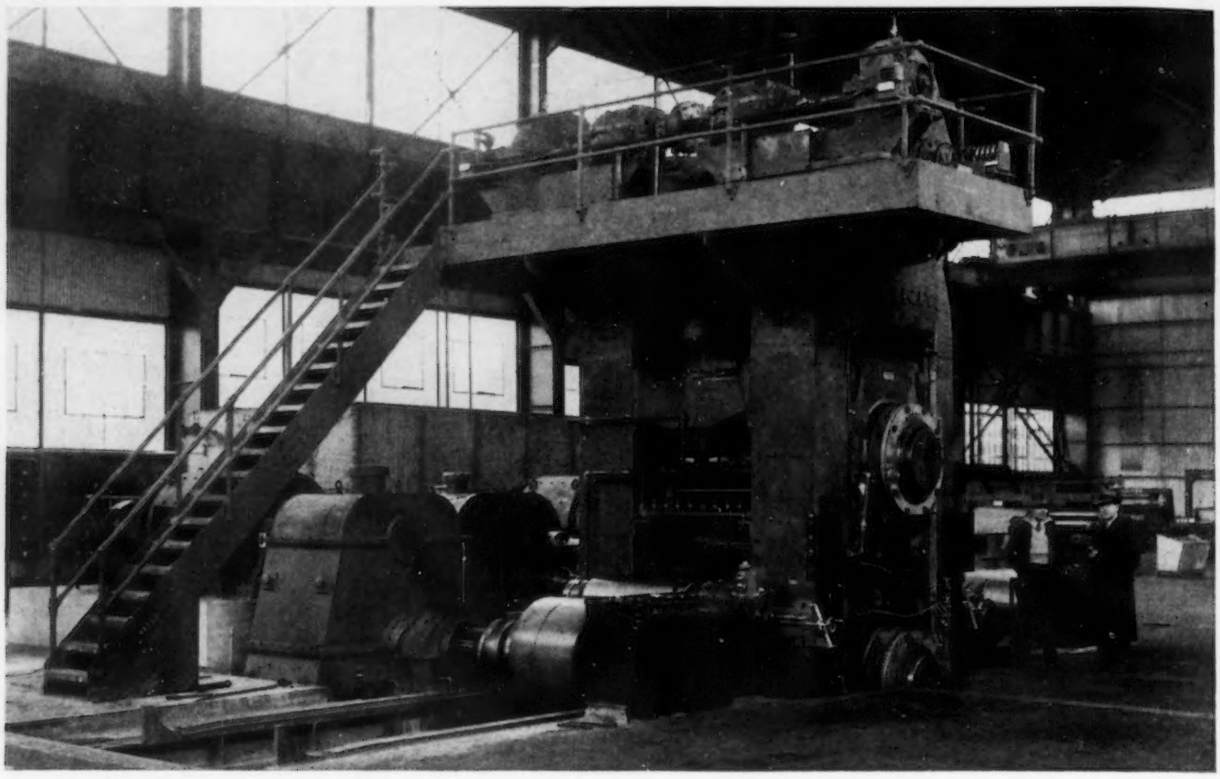
Runout Table Has Individually-Driven Rollers

The last stand of the finishing train has a maximum delivery speed of 1200 ft. per min. From it the hot rolled strip advances to an up-coiler over a 200-ft.-long, two-section runout table equipped with 102 and 16 rollers respectively. These rollers are 10 in. in diameter, 90 in. wide, and each of them is individually motor driven through a speed reducer. They are tied into a frequency set so that any variable delivery motor speed from 600 to 1800 r.p.m. can be obtained. Each of the two sections of the table can be started and stopped individually, and dynamic braking is provided on the 102-motor section for quick stopping.

From the finishing mills, the hot rolled material proceeds in one of three different lines for further processing.

If plate, it advances to a chain-driven transfer, and then leaves the main mill line for leveling, trimming and shearing into required lengths.

For strip, the processing route is past the plate transfer to a three-roll up-coiler with capacity for coiling 84-in.-wide material to an O.D. of 52 in. Coils travel by



SINGLE reversing four-high cold reduction mill. A Pratt & Whitney Electrolimit gage permits continuous gaging without stopping or slowing down the mill and a Selsyn screwdown indicator shows movement of the screw in increments as small as 0.0001 in.

gravity conveyor across a Fairbanks - Morse printing - weighing scale, from which they are carried by crane to railroad cars for transportation either to the coil pickler for cold reduction or to the old style two-high hot mills as breakdowns.

Sheet Line

In the case of sheets (3/16 in. and under) the hot rolled material proceeds to the strip up-coiler but passes in a straight line under it, space being made for its passage by elevating the up-coiler ramp. The rolled strip continues to a pair of pinch rolls that feed them into a drum-type flying shear, one of the interesting units of modern strip mills. This is a compact machine with a 90-in. blade and a gear box that provides a large variety of combinations of cutting speeds and ratios. Normally, sheets will be cut into multiple lengths of 8 to 20 ft., leaving the piler pinch rolls at speeds ranging from 150 to 600 ft. per min.

In the far right-hand end of the sheet floor there is a 3/16 x 84-in. shearing line. Sheets from the flying shears are put up in lift form on a rack table and conveyed into a slitter, the trimmed sheets then advancing through a roller leveler to an up-cut shear for cutting accurately to length. This shear is equipped with an automatic sizing table and a gage that is adjustable for automatic cutting of 2½ to 20-ft. lengths, in increments of ¼ in. The sheets are then racked and piled, ready for shipment.

Motor Room Inclosed and Ventilated

The main drive motors of the roughing scale breaker, the roughing plate mill, the finishing scale breaker and of the four stands of the finishing mill, together with a number of motor generator sets, transformers, control boards and other electrical equipment are housed in an inclosed motor room to assure maximum cleanliness and to facilitate maintenance. This room is approximately 300 ft. long by 54 ft. wide and has a basement from which the main drive motors are constantly ventilated by cooled air under pressure. The recirculating system includes a makeup fan in the motor room that supplies filtered air to replace that lost through doors and other openings. Here as elsewhere in the new mill, most of the electrical equipment was supplied by the Allis-Chalmers Mfg. Co.

Adjacent to the slab reheating furnace and at about the center of the hot mill rolling line there is a room inclosing a 60-in. by 24-ft. Mesta roll grinder for the conditioning of the rolls of the hot strip finishing stands and the rolls of the cold mill, located in another building. The machine is insulated against vibration by means of sand packed around the concrete foundation.

Cold Strip Mill

The new cold strip division is equipped with the most modern facilities, the major unit of which is the single reversing four-high cold reduction mill.

The continuous processing begins with joining the ends of two previously unwound coils of hot strip by means of oxy-acetylene blowpipe or torch. The double coils are then loosely recoiled and

conveyed to a coil pickling unit of a new central mast design. From the pickling operation the loosely wound welded coils go through a drying room and to an oiler house, where they are spray coated with oil. The coils then advance by conveyor to the cold mill room, which is entirely inclosed. Here they are put through a tight coiling operation preparatory to passing through the cold reduction mill.

This mill has 16½ x 48-in. work rolls and 49 x 48-in. backing-up rolls. It is driven by a 1250-hp. motor and each of its tension reels is powered by a 550-hp. motor. Strip tension is automatically controlled, and the strip is continuously and accurately gaged by means of a Pratt & Whitney electric limit device, without stopping or slowing down the mill. A screwdown indicator, made up of a Selsyn instrument and counter, indicates movement of the screw in increments as small as 0.0001 in.

Subsequent processing includes trimming in a rotary side trimming shear, and cutting to length in a flying shear. The latter is push-button controlled and is adjustable to a maximum speed of 300 ft. per min.

New Turbine Generators Installed

To take care of the additional power required by the new continuous hot and cold strip mills and also by the company's North plant sheet mill, power for which formerly was purchased from a local power company, two 7500-kw. Allis-Chalmers turbine generators have been added to the two 3000-kw. General Electric mixed-pressure turbine generators previously installed. These machines take 400 lb., 640 deg. F. steam at the throttle, and extract, or bleed, a maximum of 100,000 lb. of steam per hr. at 160 lb. pressure for processing, for the reciprocating mill engines and for the previously installed mixed-pressure turbines. Steam for the latter was formerly supplied directly from the steam generators operating at lower pressure. Other new power plant equipment includes Allis-Chalmers surface condensers; circulating and condensate centrifugal pumps; a Marley Co. cooling tower; a Swartwout Co. steam pressure and desuperheating station; and a new surge tank to receive condensate from the new turbines.

The steam generating plant is the same as heretofore. It consists of three Combustion Engineering steam generating units, two installed in 1927 and one in 1931.

Four new overhead electric traveling cranes, all supplied by the Harnischfeger Corp. and equipped with Cutler-Hammer magnetic control, complete the new equipment required for the new hot and cold strip mills. Those in the hot mill are: One 75-ton, with 25-ton auxiliary, 70 ft. span; one 25-ton, 70-ft. span; and one 25-ton, 50-ft. span, the latter installed in the slab storage building. The cold mill required a 50-ton, 75-ft. span crane with 10-ton auxiliary.

A UNIQUE application of conveyors in the production of strip aluminum is shown in the accompanying illustration. Hot strip is roller-conveyed from the rolling mill to a coiler, and from the latter the coils are automatically discharged on to a troughed roller conveyor which acts as a loading station for a coil upender. From the upender the coil travels over a roller conveyor to an automatically-operated electric hoist designed to elevate the coils and discharge them on to a conveyor that serves as a cooling table and also affords temporary storage. From this point the coils travel on conveyors to the finishing department where the aluminum strip is trimmed and cut to specified lengths. The coils average 21 in. in diameter and are up to 36 in. in length. They weigh 250 lb.

(Photo by courtesy of Mathews Conveyer Co., Ellwood City, Pa.)

The Flexibility of the Industrial Truck

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By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

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IN the modern industrial truck two major developments are evident; greater load-carrying capacity, and many different means of picking up the load. This is a continuation of "Self-Powered Mobile Handling Equipment" which appeared in the issue of Feb. 18, 1937.

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IN a general way the advantages and limitations of industrial trucks and tractor trains were outlined in the previous discussion of this series, published in the issue of Feb. 18, 1937, under the title, "Self-Powered Mobile Handling Equipment." In this continuation of that article an attempt will be made to cover briefly some of the engineering problems incident to the development of the widely varied special types of equipment now available.

In the early days of electric industrial truck manufacture, both use requirements and manufacturing design were relatively simple. Loads of over three tons were unthought of. In many cases floor construction in manufacturing plants was such that heavier loads could not be safely carried. Bearings for truck wheels had not been developed to carry heavier loads, drop forgings for axles and steering knuckles seemed prone to develop faults at times of stress, truck tires were still a serious problem, and knowledge of the use of the lighter alloy steels had not progressed far enough to warrant their use in trucks designed to carry heavy loads. Engineering skill in truck design had not progressed far enough, with the backing of the requisite experience, to permit of designs which would pack into small space heavy load-carrying capacity with ample power and light weight. Finally, in those days the need was not clearly seen of developing truck designs of such types as would unite in one unit the functions of picking up loads as well as carrying them.

Under all these restrictions a general type of truck was evolved of such all-around usefulness that it is still in heavy demand. A typical example is shown in Fig. 1. This is a Yale narrow, high-platform truck with a load-carrying capacity of two tons. First manufactured commercially about 1922, it is still made substantially the same for a host of industrial applications. Other industrial truck manufacturers developed somewhat similar designs, and most of them are likewise still being made and sold.

In comparison with equipment especially developed for the more exacting and special needs of today, it is of interest to note that the frame of this truck was of pressed steel, riveted; the 84-in. by 38-in. platform was made of 1½-in. oak plank; and the batteries were carried in a metal case slung under the platform. Trucks like this are still being used for handling miscellaneous loads of material which can be placed on the platform by hand, chain block, electric hoist, ship's tackle or overhead crane service. Auxiliary equipment is frequently added, such as gravity dump bodies for handling loose material, or electrically operated swinging boom cranes. The large wheels and full spring suspension permit efficient operation over rough surfaces as well as smooth.

By way of contrast the Automatic Transportation unit shown in Fig. 2 provides several points of interest. Especially designed to pick up as well as to carry heavy loads of dies, jigs, sheet metal, and so forth, this truck has a lifting and load-carrying capacity of 30 tons. Special skids of a height corresponding to the beds of forming presses carry the dies or other materials to be transferred. The lift platform of the truck runs un-

der the skids, and by means of a reduction gear drive and double 1¼-in. pitch Diamond roller chains, lifts the skid and its load clear from the floor, after which the truck performs its second function of a transportation unit.

Even heavier loads are being successfully handled today, and truck technique is rapidly displacing the overhead crane for placing heavy dies on presses and taking them off again. The type of die-handling truck shown in Fig. 2 has attained great favor, as it permits the changing of dies quickly, with a

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FIG. 1. Yale narrow, high platform truck. Substantially the same design as first made in 1922.

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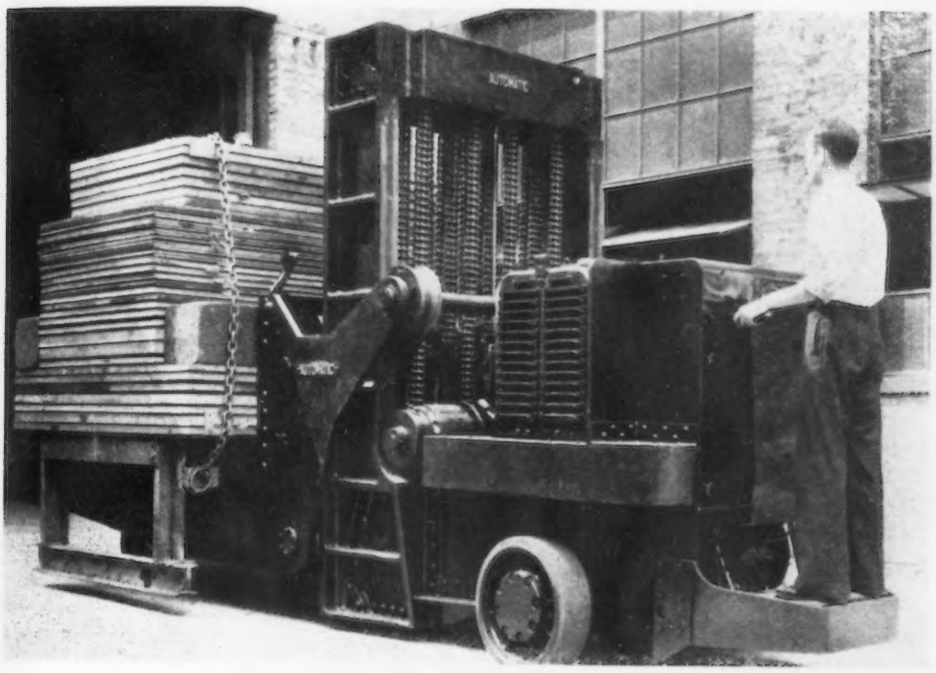

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FIG. 2. Modern Automatic Transportation 30 ton capacity lift truck. Practically the ultimate in the single lift-shift unit.

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FIG. 3. Baker-Raulang trailer - truck method of handling 40 to 60-ton dies. The fork truck alone may be used for carrying five ton dies.

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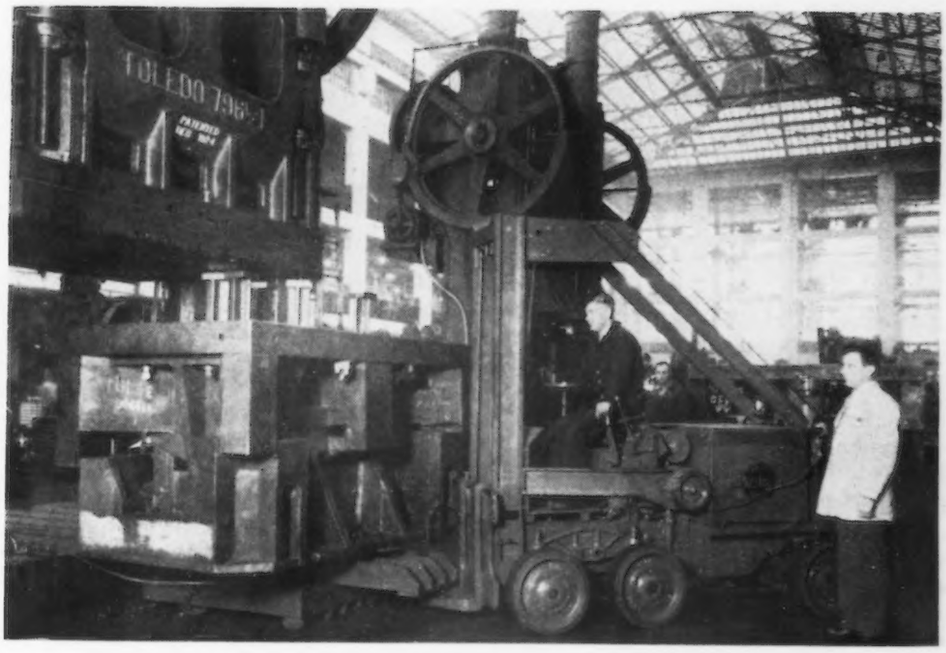

small gang, and safely. Likewise, it permits the dies to be carried *out* of the press room for storage in the plant or yard without the rehandling that is necessary when depending upon the overhead crane. But the maximum load-carrying capacity of such trucks is 30 tons, while many of the dies in use today for the production of all-steel tops and bodies of automobiles weigh up to double that figure. And a truck of the size and capacity required even for 30-ton dies is strictly a one-purpose machine, representing a considerable investment which must lie idle for a great part of the time.

Confronted with the problem of handling, changing and storing dies weighing up to 40 tons, and facing the possibility of using 60-ton dies in the near future, engineers of the Cadillac Motor Co. worked out with the Baker-Raulang engineering staff a new technique which may obsolete all other methods of handling heavy dies. The equipment required is extremely flexible in operation, and permits the dies to be changed in the shortest possible time with a very small force of men.

Fig. 3 shows the special truck and semi-trailer which was developed. The trailers are made with a single axle so placed that the weight of the dies will almost balance. Since the weight is all on the trailer, a truck of relatively small capacity can be used, of such a design as to permit of lighter dies, up to about five tons in weight, being carried directly on the truck.

The trailer platform is about ½ in. above the height of the press bed, but when one end is tilted down it is exactly at press bed level. The trailer is pushed to the press, wire cables running from electrically operated winches on the truck are hooked to the die, and the die is drawn smoothly off the press bed onto the trailer. The operation of getting a die onto the press from the trailer is accomplished by running the cables through reversing sheaves attached temporarily to the press frame, or the trailer is set in position on one side of the press and the truck run around to the other side of the press to permit the cables to draw the die off the trailer through the press.

The truck itself is a heavy-duty, six-wheel, two-motor, four-wheel drive fork truck which steers on four wheels. It has a capacity of five tons, and is equipped with removable and interchangeable forks and coupling socket. When carrying smaller dies, the truck can be used to tier them in storage, if desired, in order to increase the available storage space without increasing the floor space. A view of the truck and trailer combination moving a 40-ton die is shown in Fig. 4.

The Yale high lift truck of two tons' capacity, shown in Fig. 5, is designed as a self-loading transportation unit combining the advantages of both low lift and high lift, as well as trailer haulage. It may be used to lift loaded skids from the floor and transport them to another place, or to raise them to such a height that the cost of stacking or tiering in storerooms, freight

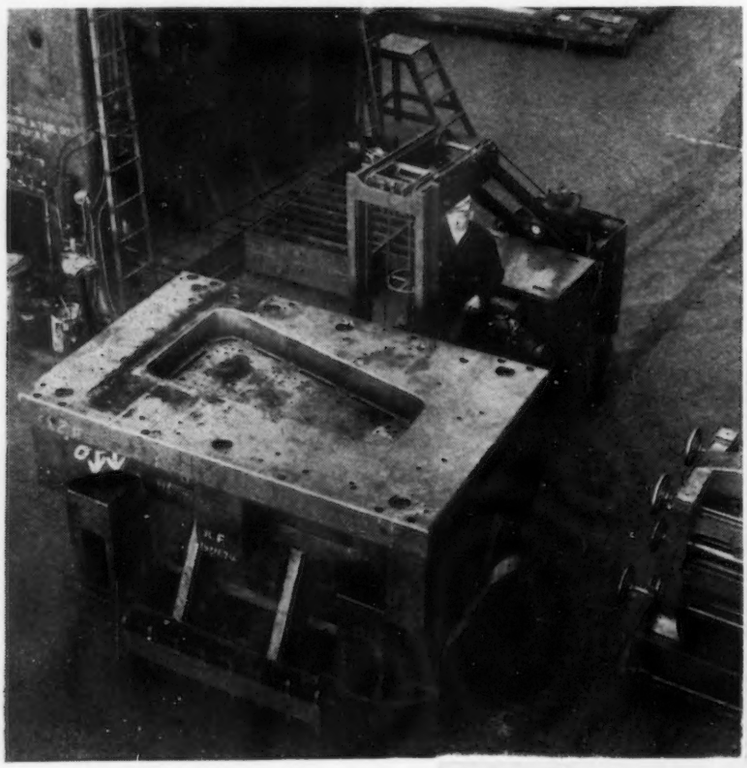

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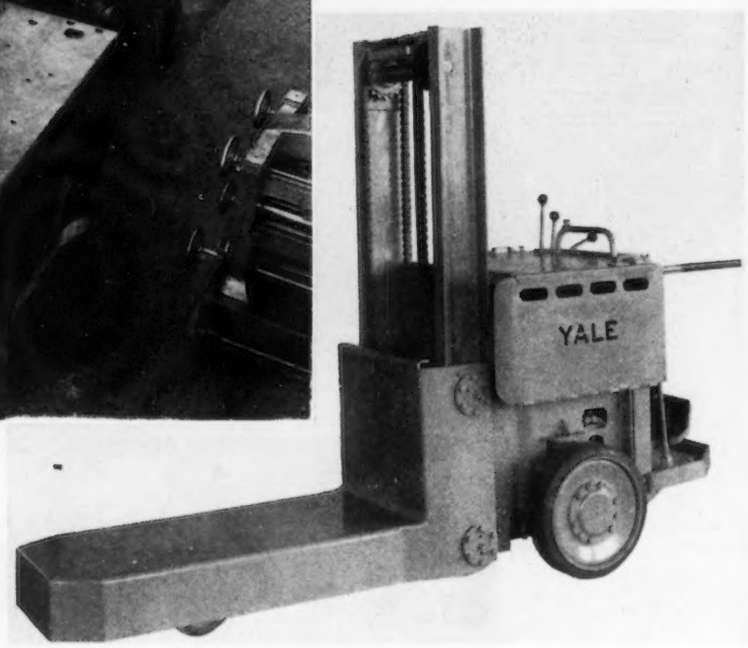
FIG. 4. The Baker-Raulang combination truck and trailer moving 40 tons in one load at the Cadillac Motor Co., Detroit.

o o o



AT RIGHT

FIG. 5. Yale two-ton skid-lifting truck of single or multiple lift type. The multiple (telescoping) lift raises the platform up to 83 inches above the floor.

cars or steamship holds is reduced to a minimum. By means of triple reduction spur gearing and single roller chain, the platform can be raised in the telescopic models to a height of 83 in. from the floor. This truck has two-wheel drive and four-wheel steering. Capacity loads can be raised at the rate of 15 ft. per minute, and lowered at 28 ft. per minute. With this type of truck the loads must be placed on skids in various heights up to a maximum of 98½ in. above the floor level. The truck has two-wheel drive, and steering is by means of the two rear wheels only. The fork capacity is from 1500 lb. to 2500 lb.

Still another type of modern lift-shift truck which has gained great favor in steel mills and plants handling strip metal is shown in Fig. 7. The trucks illustrated are Elwell-Parker heavy-duty ram trucks for handling coiled strip steel. They are built in various load-carrying capacities for coils up to 96 in. in width and weighing 10 tons. Four-wheel drive and four-wheel steering enables these trucks to be turned in close quarters.

Two factors have spurred the industrial truck manufacturers to increased efforts during recent years. One is the factor of the increasing weights of the loads to be handled, as evidenced in the heavy dies used for automobile body work, the handling of metal in steel mills and fabricating plants, and the handling of loads of heavy sheet metal such as tin plate. The other factor is the growing consciousness of the value of "air-rights" in storage; that is, the utilization of storage space on a cubic foot basis instead of merely on a square foot basis. This latter factor has led more and more to the development of efficient and economical means of stacking or tiering materials vertically as well as placing them horizontally.

The problems of combining great strength with comparative lightness of construction and a wide versatility of action in the modern industrial truck have been met by a combination of events. First, the development of alloy steels has come at a most propitious moment; second, heat-treating skill has been developed to a point of amazing resourcefulness; third, the drop-forging art has advanced so materially that flawless, homogeneous forgings can now be obtained to meet the increasingly heavy demands on axles, shafts, and steering knuckles. Finally, the most complete advantage has been taken of all these outside developments by the exercise of patient and painstaking skill within the industry by intensively trained and experienced engineering staffs.

The self-powered, mobile handling unit is scarcely a quarter of a century old, yet its developments probably include a greater amount of engineering thought than any other single form of mechanical handling apparatus. No one knows yet just what the actual physical limitations of this type of equipment may be, or the entire range of its usefulness in the matter of more efficiently and economically handling the materials of industry.

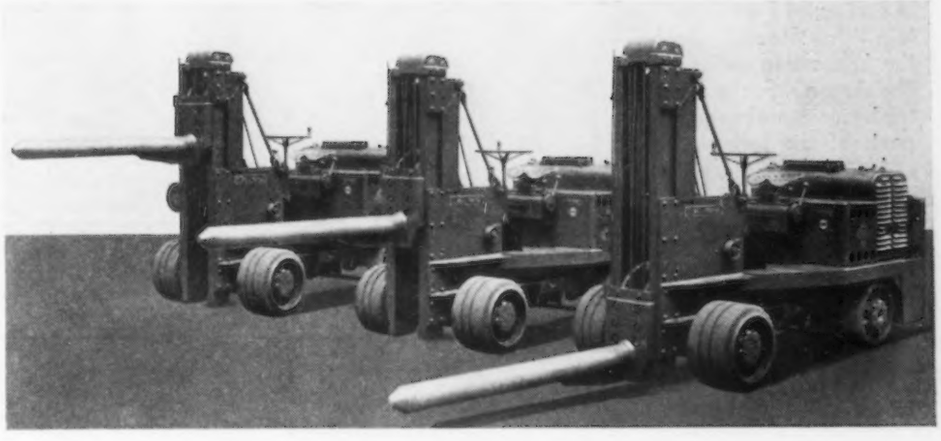
ABOVE

FIG. 6. Yale tilting, tiering, telescoping fork-type truck with 72-inch forks for skid boards or pallet lifting. Maximum lift is 98½ inches.

o o o

AT RIGHT

FIG. 7. Elwell-Parker ram trucks for picking up and carrying coils of strip steel up to 96 inches in width and 10 tons in weight.



with standard floor clearances (8 in. to 12 in.) to be handled.

Fig. 6 shows a Yale tilting, tiering, telescoping fork-type truck which will pick up loads on skid boards or pallets having an underclearance of only 2 in. The forks are 72 in. long, and the supporting uprights holding the forks and carrying the roller chain-lifting mechanism can be carried in a vertical position, tilted forward five degrees for picking up loads, or tilted backward 15 degrees for carrying them. Lifts are available

HEAT EFFECT *in* WELDING

• *concluded* •

By Dr. W. G. THEISINGER

Welding and Metallurgical Engineer, Lukens Steel Co., Coatesville, Pa.

Certain Alloy Steels

THIS article, the second section of Part 3, on "Certain Alloy Steels," concludes the interesting series by Dr. Theisinger. For a listing of the issues containing previous parts of the series see THE IRON AGE of Feb. 25, page 28

Nickel Steels

To obtain some idea of the effect of nickel in combination with carbon in steel, three types of steels of comparable analyses were studied. The same method of welding was employed as for the other steels. A bare, 5/32-in. diameter, plain carbon steel electrode was used to deposit a bead on the top surface of the 9 x 2 x ½-in. plates.

The series of steels examined was as follows:

3.45 per cent nickel, 0.30 per cent carbon—Fig. 22a.

3.40 per cent nickel, 0.20 per cent carbon—Fig. 22b.

2.15 per cent nickel, 0.17 per cent carbon—Fig. 22c.

For all practical purposes, we have two 3½ per cent nickel steels: one with 0.30 per cent carbon, the other with 0.20 per cent carbon. Then there is also two 0.20 per cent carbon steels; one with 3½ per cent nickel, the other containing 2.00 per cent nickel. This relationship gives us decreasing amounts of nickel and carbon. Since nickel intensifies the hardening power of carbon, the influence of varying amounts of both elements ought to be studied.

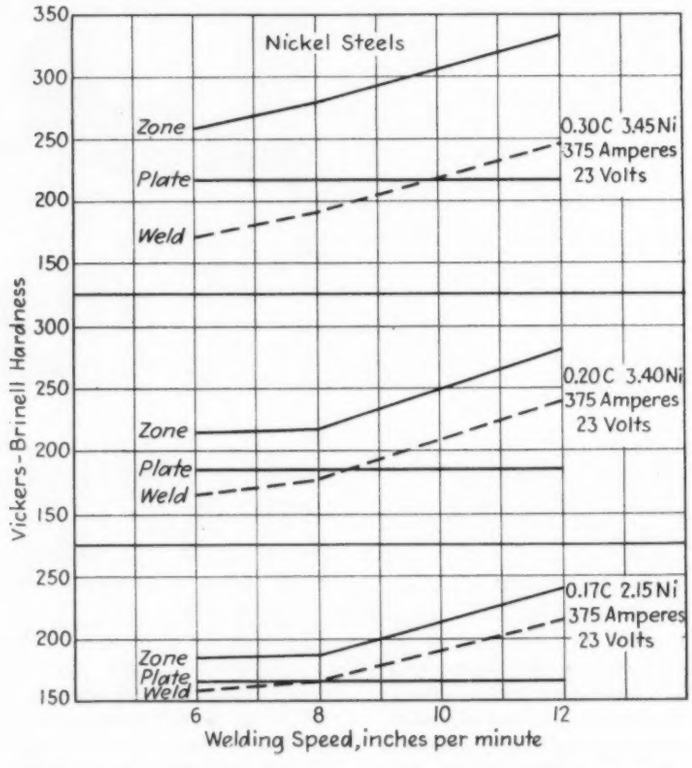


FIG. 22—(a) Nickel steel; (b) Effect of decreasing carbon with the same nickel content; (c) Effect of decreasing nickel with the same carbon content.

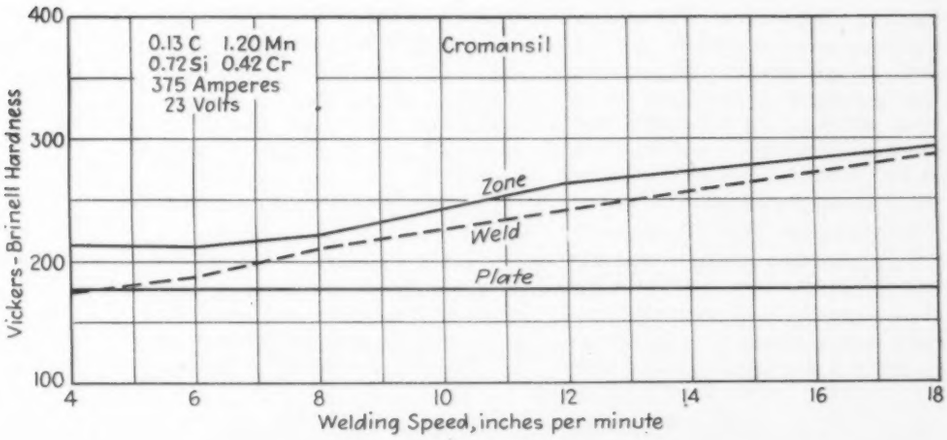


FIG. 23—Cromansil steel. Maximum allowable welding speed based on 100 points Brinell—15 in. per min.

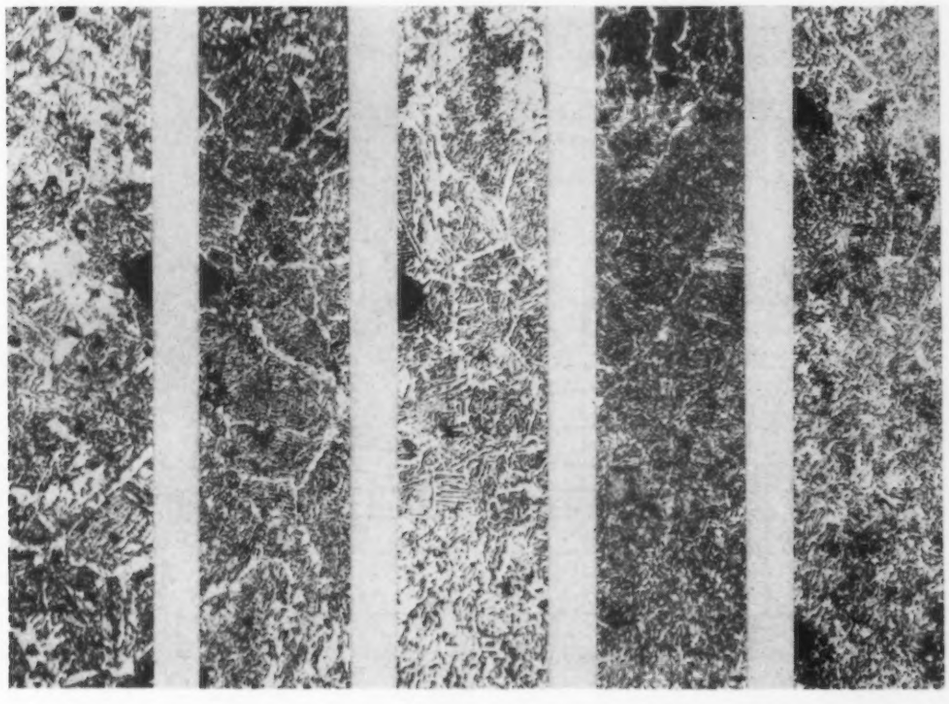


FIG. 24—Cromansil steel, 150x—1.0 per cent Nital. Welding speeds of 4, 6, 8, 12, and 18 in. per min. Pearlite and sorbite.

The samples were run at welding speeds of 6, 8 and 12 in. a minute.

The higher the carbon or nickel, the greater is the hardness of both the affected and unaffected plate metal. (Readings in Vickers-Brinell).

	Unaffected Plate	Affected Plate at Welding Speeds 6 In.	8 in.	12 In.
Fig. 22a	218	258	278	333
Fig. 22b	185	215	218	282
Fig. 22c	166	185	187	240

By dropping the carbon content, there is a considerable decrease in the hardness of the 3½ per cent nickel steel, and the allowable welding range is increased. Also there is then no difference in the hardness obtained between the 6 and 8-in. welding speeds. There is also a decrease in hardness if the nickel content is lowered as well as the carbon. The lower nickel—low carbon is the least hardenable of the series.

Here is another example of the effect of carbon on the heat affected zone produced by welding. While it is true that the higher tensile and yield point properties are attractive, the magnitude of metallurgical damage to the plate adjacent to the weld is increased as well. This fact should be given consideration in the selection of ferrous metals for welding.

Low Carbon Special Steel

Because of the tremendous influence which carbon has on the hardening properties of steel and the hardening in the plate adjacent to a weld, more and more attention is being given to the low car-

bon-low alloy steels. It appears that the most suitable welding steel, where strength higher than that possessed by the plain structural steels, is one in which some alloying elements are added to low carbon content in order to produce the desired physicals.

The most important requirement for such welding steels is that the carbon must be low. Although there seems to be considerable latitude in the choice of special elements, it is not to be assumed that haphazard selection is a wise course to pursue. Weldability must be taken into account with even greater care since the heat effect means nothing if the special steel does not weld readily.

A chromium-manganese-silicon alloy steel, known to the trade as Cromansil was developed to meet the metallurgical requirements of welding. The samples investigated were of the following analysis: Carbon, 0.13 per cent; chromium, 0.42; manganese, 1.20; and silicon, 0.72 per cent.

These specimens like the others described herein were welded by depositing a bead on the top surface of the plate with a bare 5/32-in., plain carbon steel electrode. Here again the proper welding rod is a covered electrode of a composition similar to the plate.

Fig. 23 shows the hardness curves of this steel welded at speeds of 4, 6, 8, 12 and 18 in. a minute.

The maximum difference between plate and hard zone is only 113 points Vickers-Brinell at 18 in. a minute. This shows a wide range of weldability and keeps the usual welding practices within the bounds of commercial technique. This steel welded easily up to 18 in. a minute, where if only slightly preheated, this speed was as easily performed as any of the slower welding speeds.

The photomicrographs, Fig. 24, show that the highest order of structural constituents, even after an 18-in. welding speed, is no greater than fine-grained sorbite. At the slower rates of deposition, the structure is, of course, pearlitic. The desirable effect of combining special elements with low carbon in steel is illustrated by these photomicrographs showing that sorbite and not martensite is found in the plate metal adjacent to the weld. Special elements have imparted physical properties without the high hardening power characteristic of carbon.

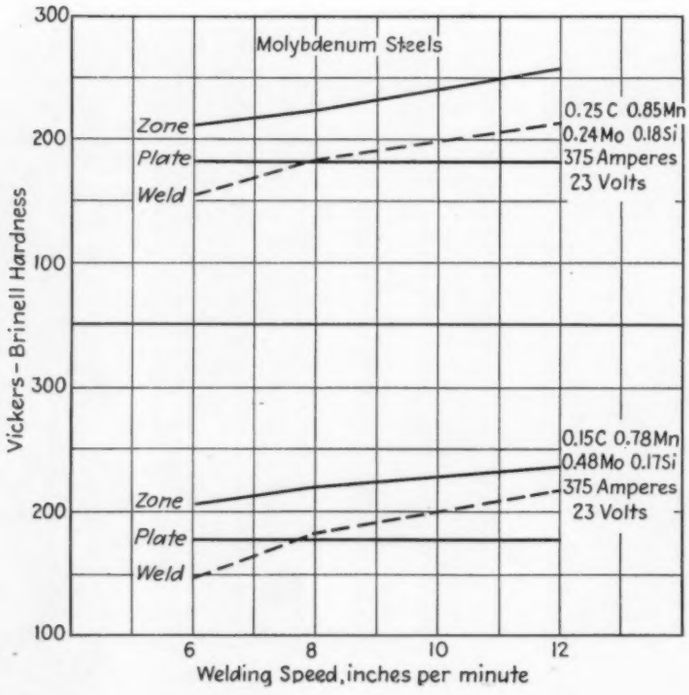


FIG. 25—(a) Molybdenum steel; (b) effect of decreasing carbon content with increased molybdenum.

Carbon-Molybdenum Steels

Two types of carbon-molybdenum steel were studied by welding and examining as described for the other steels. The effect of both carbon and molybdenum can be illustrated with the following steels.

	Fig. 25a	Fig. 25b
Carbon	0.25 per cent	0.15 per cent
Molybdenum...	0.24	0.48
Manganese ...	0.85	0.78
Silicon	0.18	0.17

It is only necessary to deal with the carbon and molybdenum contents of these steels as the manganese and silicon analyses may be considered to be identical. The physical properties of the molybdenum steels are desirable from a structural viewpoint. In addition to this point in its favor, a molybdenum addition to steel seems to increase the weldability of the plate—at least, it is a definite fact that molybdenum in steel does not place any difficulty in the way of welding.

Fig. 25a shows the hardness curve of the higher carbon steel. Although the rise in hardness is gradual, there is a steady increase in the hardness of the hard zone adjacent to the weld. On the other hand, the lower carbon, Fig. 25b, with twice as much molybdenum as the first sample, indicates that an increased rate of welding produces but little additional hardening in the plate.

The 0.17 per cent carbon—0.48 per cent molybdenum type of steel gives promise of considerable commercial importance in the welding field. It combines ease of weldability, low hardening power in the plate metal adjacent to the weld and high physical strength and ductility.

Stress Relieving

No study of this kind in which metallurgical changes are produced by welding in the plate metal adjacent to the weld would serve its purpose unless some effort was made to give a few illustrations of the effect of the common stress relieving treatment

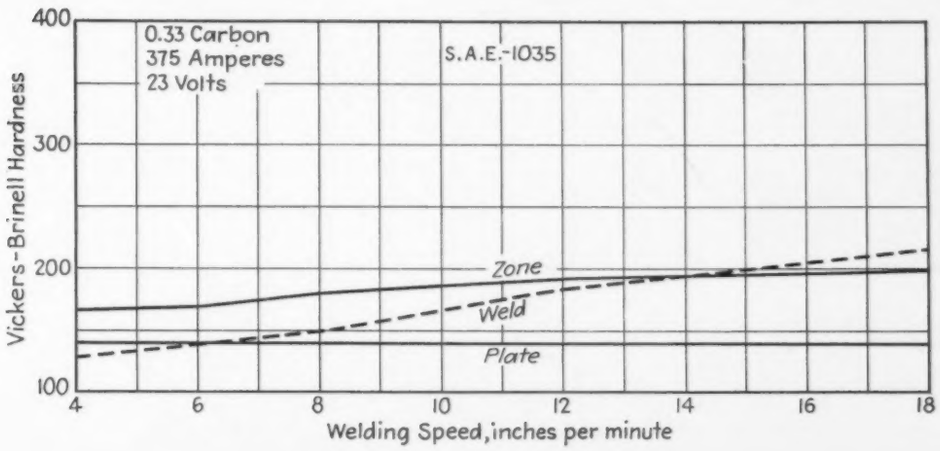


FIG. 26—S.A.E. 1035 stress relieved at 1150 deg. F.

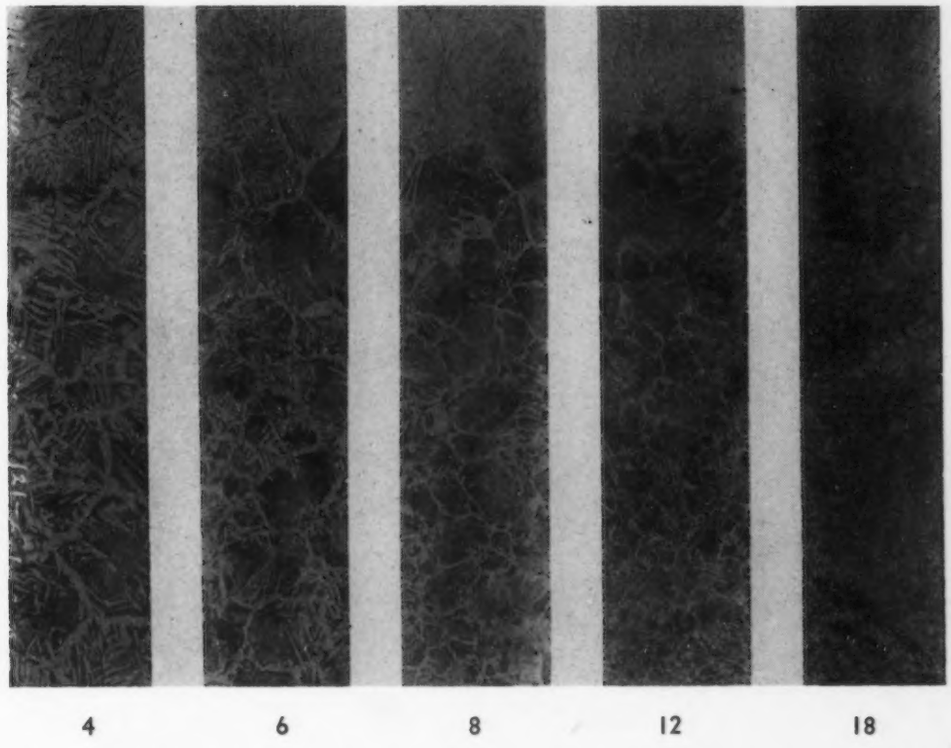


FIG. 27—S.A.E. 1035 stress relieved at 1150 deg. F.; 150x—1.0 per cent Nital. Welding speeds of 4, 6, 8, 12, and 18 in. per min. Pearlite to sorbite. Compare with Fig. 12 (The Iron Age of Dec. 17, 1936).

on this hardened zone. Two types of steels were subjected to this treatment; one with low hardening power, the other a readily hardenable special steel.

As its name implies, stress relieving is a treatment employed to reduce the residual stresses set up by welding. It is performed by heating the welded structure to a temperature slightly below the critical range, maintaining that temperature for a period of time, followed by a relatively slow cooling. Again, the microscope and the Vickers-Brinell machine are used to study the welded and treated specimens.

Two sets of specimens were selected from the experiments described in the earlier portions of this work, the results of which will be referred to for comparison. The plain carbon steel series S.A.E. 1035 and the chromium-molybdenum series S.A.E. 4150 are representative of average and abnormal conditions, respectively. The test sections for this study were cut from the remaining piece of the welded samples from which the previously described regular tests were taken and after the remaining piece had been subjected to the stress relieving treatment. These sections were taken adjacent to where the section was removed for the earlier experiments.

Effects of Stress Relieving

The stress relieving treatment consisted of heating the welded samples slowly to 1150 deg. F., holding that temperature for ½ hr. and cooling in the furnace. The specimens were polished and etched as before. It was found that the stress relieving treatment does

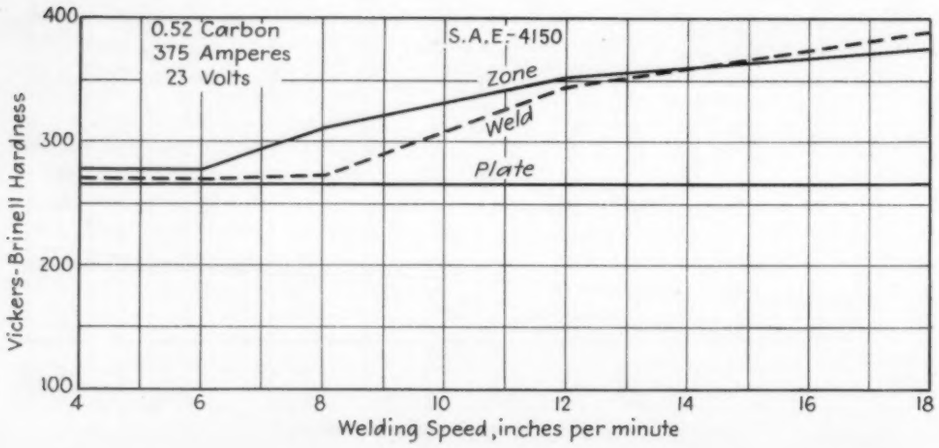


FIG. 28—S.A.E. 4150 stress relieved at 1150 deg. F.

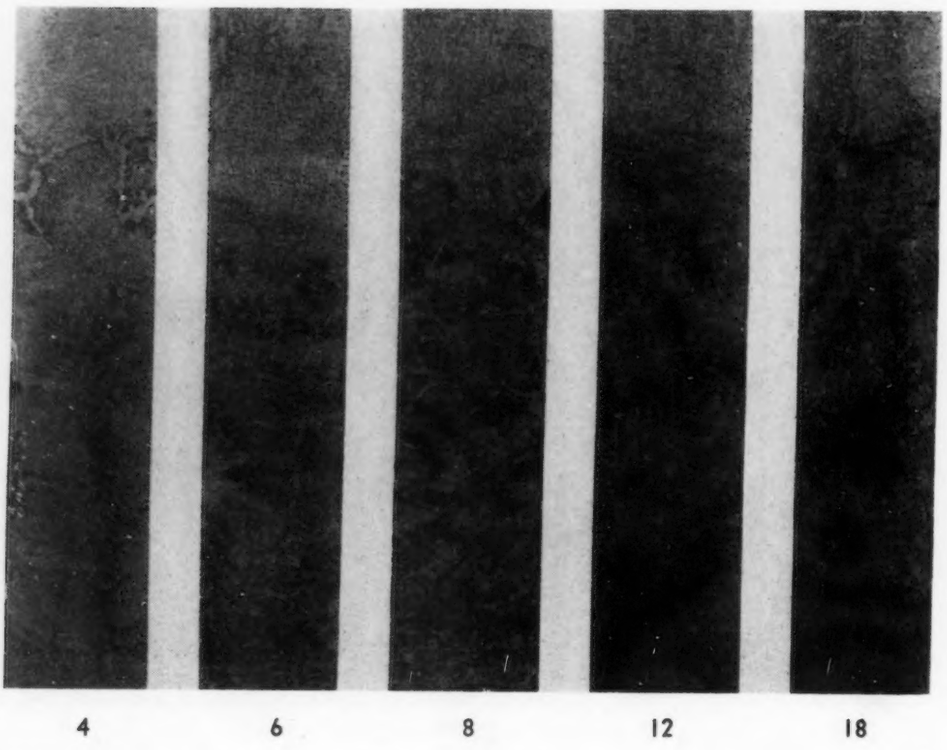


FIG. 29—S.A.E. 4150 stress relieved at 1150 deg. F.; 150x—1.0 per cent Nital. Welding speeds of 4, 6, 8, 12 and 18 in. per min. Fine grained sorbite. Compare with Fig. 20 of previous article.

affect the microstructure and hardness of the weld and heat affected zones. This treatment produced the most drastic changes where the original hardness was greatest. For example: the S.A.E. 4150 sample welded at 18 in. a minute had a hardness of 642 Vickers-Brinell in the plate metal adjacent to the weld, while, after stress relieving the hardness for the same region was 376. On the other hand, the S.A.E. 1035 sample welded at 18 in. a minute had a hardness of 250 as welded, and was only reduced to 200 by the stress relieving treatment.

This relationship is more pronounced when the slower speeds are studied. In the S.A.E. 4150 sample welded at 6 in. a minute, the hardness after welding was 301 and after treatment fell off to 277. The same welding speed on the S.A.E. 1035 steel developed a hardness of 170, and after stress relieving the hardness was still 170. Since this value is very close to the hardness of the unaffected plate metal, we would not expect 1150 deg. F. to cause softening, whereas it should have a marked effect on a martensitic structure such as made up the S.A.E. 4150 specimen of 642 Vickers-Brinell.

The stress relieving treatment has had the same effect on the microstructure as it had on the hardness values. As could be expected from a study of the hardness results, there is no change in the microstructure of the S.A.E. 1035 series. However, the S.A.E. 4150 steel revealed considerable response to the temperature of 1150 deg. F., as could be anticipated. Sorbite has replaced troostite and the dense martensite has been converted to fine-grained sorbite.

S.A.E. 1035; hardness curve Fig.

26.—By comparing these curves with Fig. 11 [THE IRON AGE of Dec. 17, 1936, page 41] it will be seen that little change has been effected. The hardness values have dropped off some, it is true, but the change has been slight. We would not expect this temperature to affect the pearlitic and sorbitic structures of the specimens.

The microstructure, Fig. 27, reveals no difference in structure than that shown in Fig. 12. Pearlite and fine-grained sorbite make up these samples in the metal adjacent to the weld.

S.A.E. 4150; hardness curve Fig. 28.—The effect of the stress relieving treatment on the hardness of the plate metal adjacent to the weld is quite marked. By comparing with Fig. 19 in this article, it is shown that the highest hardnesses in the welded plate have been reduced the most.

In Fig. 29, the microstructure of the heat-treated specimens offer a marked contrast to that of the as-welded samples, Fig. 20. The hard zone of solid martensite has been changed to fine-grained sorbite. The entire range of metallurgical damage has been reduced to a more ductile and impact resisting microstructure.

Effect of Plate Thickness

So far we have held the plate dimensions constant while varying the composition of the base metal and the speed of welding. The thickness of the plate being welded must certainly influence the results of this study since a thick base member will exert a greater quench on the heated portion than will a light plate. In order to permit a comparison between the data shown here and other work being done, the following curve, Fig. 30, is given.

A 0.43 per cent carbon steel bar, 4 x 4 in., was forged to a constant width of 2 in., but pieces were obtained at varying thicknesses of ½, ¾, 1, 1½ and 2 in. Each specimen was welded by depositing a bead on the top surface of the plate at a welding speed of 8 in. a minute. Thus we have held constant the plate composition and the welding conditions while changing the metal thickness.

The hardness of the heat-affected zone adjacent to the weld increases with increasing thickness of the plate, the most pronounced increase occurring from ½ to 1 in. From 1 to 2 in., the rise in hardness is barely noticeable. It is to be expected that over a certain point the thickness will fail to have an appreciable effect on the hardening of the heated section.

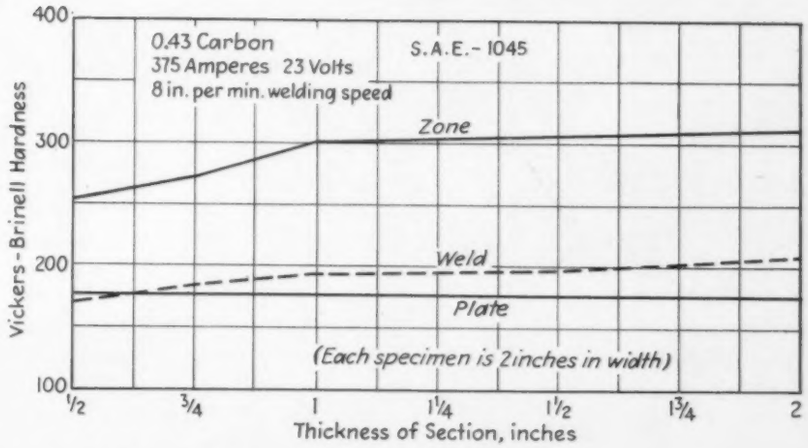


FIG. 30—S.A.E. 1045 (0.43 per cent carbon). Showing effect of thickness in increasing the hardness of the affected zone.

Conclusion

From the results of this study, we find that as the hardening power of the base metal is raised, the hardness of the affected plate metal adjacent to a weld is increased. Where this effect must be taken into consideration, for increases in hardening power of the base metal, the heat energy input of the welding process should be raised by the use of higher amperage or reduced welding speed. Although no direct experiments were carried out on the effect of preheating during welding, it is apparent that several hundred degrees of heat imparted to the structure to be welded will assist in reducing this hardening effect.

Of the elements studied, carbon exerts the greatest influence in increasing the susceptibility of the base plate to harden after welding.

Speed of welding, perhaps seldom taken into account, should be considered seriously when the hardenable steels are to be welded. The intermediate speeds are the most desirable.

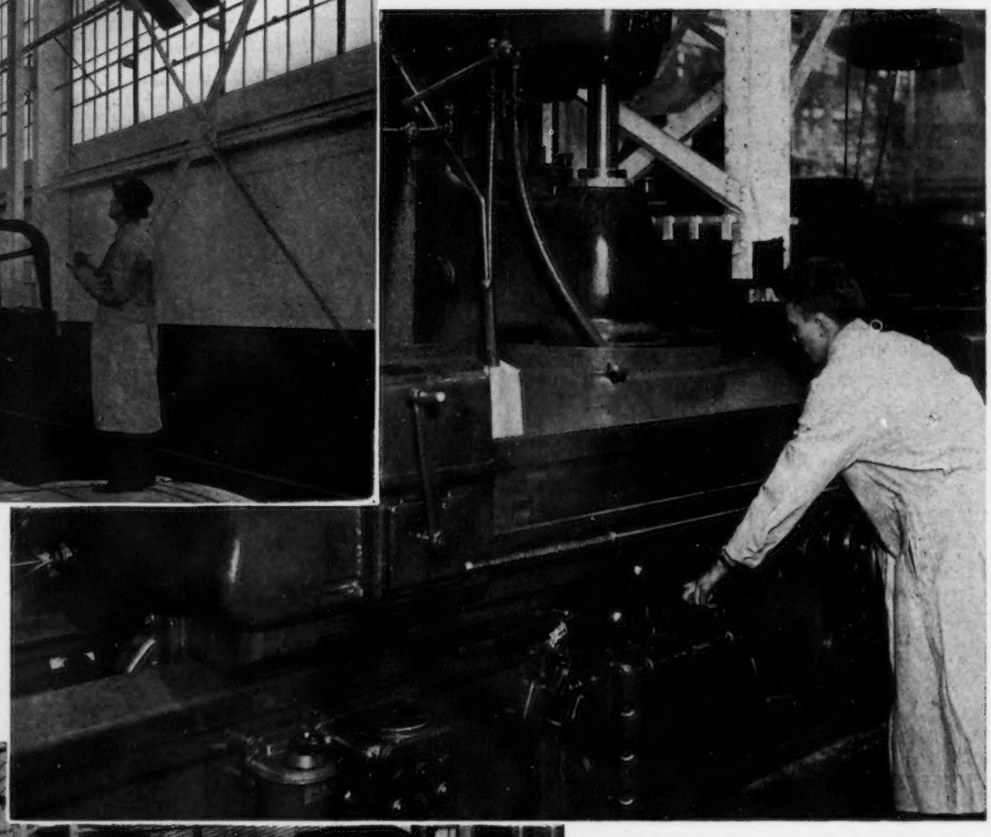
Germany Restricts Stainless Steel Use

AN order issued by the German Board of Control for Iron and Steel under date of Dec. 31, 1936, prohibits the manufacture of certain articles from stainless steel for the domestic market, according to the United States Department of Commerce. This is the first restriction imposed on the use of these steels and affects most of those uses in which stainless steel appeared to have found new important outlets within recent years, particularly cutlery, table and kitchen utensils, parts of bicycles, sporting goods and building hardware. Industrial apparatus and machines have been severely restricted in the use of stainless steel, especially brewery equipment, and machines and containers for the various foodstuffs industries. It is stated that the prohibition appears to be aimed particularly at nickel-containing steels, since the use of steels with chromium and manganese (but with no nickel or not more than 1.5 per cent nickel) is permitted until further notice, except in bicycle parts, sporting goods, and building hardware.

THE LAST WORD IN HEAVY STAMPING

GENERAL MOTORS has recently opened a new stamping division at Grand Rapids which represents the last word in modernity in layout, fabricating technique and production equipment. It is now employing more than 2100 workers.

WEIGHING the sheet steel as it comes from the flat cars. This railroad siding is entirely under cover and the picture gives a good idea of the excellent illumination of the new Grand Rapids Stamping Division of General Motors.



ABOVE

EQUIPMENT in the die shop is notable for its large size units. This is one of the new vertical surface grinders employed on die work.

o o o

AT LEFT

MATERIAL flows from the stock floor to the square shears, then to the roller levelers, before being fed to the presses.

o o o

AT RIGHT

GUN welding of the rocker channels to the sides of the underbody of a "Unisteel" Fisher Body. The steel floor shown is braced cross-wise with U-beams of heavier metal and lengthwise by the rockers. Gun welders are of Fisher Body design and are operated pneumatically, with electric timing.

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BELOW

ONE of the three 750-ton presses, each weighing over 500 tons. This particular unit is performing the second forming operation on Fisher body turret tops.

ABOVE

CONVEYORIZATION is used wherever possible. This view shows turret tops being counted automatically as they leave the end of the production line on the overhead monorail conveyor.

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Interesting Facts About Iron and Steel

COMPILED
by C. E. WRIGHT

READERS are invited to send suggestions or inquiries that will result in interesting facts that may be published from time to time in this column.

A prospective advance in the price of Lake Superior ores draws attention to the fact that the lowest prices ever quoted for these ores were $2.60 a ton for old-range bessemer in 1897, $2.15 for Mesabi bessemer in 1895, $1.85 for old-range non-bessemer in 1898, and $1.75 for Mesabi non-bessemer in 1898.

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An Indian massacre foiled the first attempt to manufacture iron in this country, at Falling Creek, Va., by the Virginia Co., in March, 1622, the manager and all of the workmen being killed and the works destroyed. Apparently, according to Swank in his *Iron in All Ages*, not a pound of iron was made in Virginia up to the beginning of the eighteenth century.

The first iron article made from native iron ore in America was an iron pot weighing 2 lb., 13 oz. with a capacity of nearly one quart, which was cast at Lynn, Mass., in 1645.

o o o

Believe it or not (with apologies to Mr. Ripley) dog foods are one of the largest outlets for tin plate (in the form of cans) in the United States and vie with condensed milk for first position. If such vegetables as corn, peas, tomatoes, etc., are considered together they are in the lead, but taken separately none of these popular canned vegetables takes as many cans as food for dogs. We asked a grocer about this, and he explained that dog owners usually buy dog foods six cans at a time, while canned corn or peas are bought one or two cans at a time. A dog will use a can of food a day.

The first case on record where iron ore was exported from America, according to Swank's *Iron in All Ages*, was in 1608, just one year after the founding at Jamestown of the first permanent English colony in this country. A ship of the Virginia Co. of London, which established the first settlement here, sailed back to England with a cargo of "iron ore, sassafras, cedar posts, and walnut boards." This ore, according to Neill's history of the Virginia Co., was later smelted, and "seventeen tons of metal were sold at £4 per ton to the East India Co.," thus marking the first iron ever to be made by Europeans from American ore.

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Manufacture of horseshoes still constitutes a fairly substantial business in the United States despite increasing motorization. However, the business has dwindled year by year, having amounted to $1,560,478 in total sales in 1935 against $4,217,604 in 1925.

Owing to the tremendous demand for steel products created by the World War, the largest addition ever made to capacity in a single year was completed in 1917 when 97 open-hearth furnaces with a total annual capacity of 4,326,500 tons of ingots were made available for production. Fourteen blast furnaces with a capacity of 2,520,000 tons of pig iron were completed the same year. The United States Steel Corp. alone increased its annual ingot capacity by 1,220,000 tons in that year. In 1916, 103 open hearths were completed, but the total capacity was 121,500 tons below that added in 1917.

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The term base box as applied to tin plate originated in Great Britain, where then, as now, it meant 31,360 sq. in., or 217.78 sq. ft. of tin plate—the area covered by 112 sheets of 14 x 20 in.

o o o

An interesting fact dug up by the American Iron and Steel Institute is that every steel mill purchasing agent is a buyer of green saplings. About 20,000 of these were purchased last year by the steel mills of the country. They are used to stir molten steel to reduce the amount of carbon. The saplings used are from 16 to 20 ft. long and 3 to 4 in. thick at the butt end. Elm, ash, oak and hickory are generally used. Stirring the molten steel with green saplings produces a violent boiling of agitation in the steel as the carbon in the sapling and the oxygen in the metal react chemically. This agitation mixes the steel thoroughly with the layer of molten limestone or slag floating on top of the steel, and the excess carbon is absorbed in the slag.

o o o

The highest price at which No. 1 heavy melting steel has ever been sold at Pittsburgh was $41 per ton in June, 1917, while the lowest was in July, 1932, when it was quoted at $8.25.

Iron bars were once sold by peddlers or over a merchant's counter just like a bolt of cloth, and thus came to be known as merchant bars, according to the employees' publication of the Youngstown Sheet & Tube Co. More than 200 years ago the term "merchant bar" was described in an English pamphlet as "such shaped iron as is usually imported by the merchant, about 1½ or 2 in. broad and 1/3 in. thick, and squares of different sizes." As the iron industry grew larger sizes were rolled, but the mills rolling the lighter sections for stock and general resale purposes came to be known as merchant mills.

o o o

Since 1900 THE IRON AGE'S composite pig iron price has been as high as $52.11 a ton, and as low as $11.84. The peak was reached in July, 1917, and the low in July, 1904. During the recent depression the lowest point reached by this composite was $13.56, from December, 1932, through March, 1933.

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Steel rails when first made in 1867 were quoted at $166 per ton, but sank to an all-time low of $17 per ton, in December, 1898.

o o o

The Aliquippa, Pa., works of the Jones & Laughlin Steel Corp. includes three of the five largest blast furnaces in the United States, according to the 1935 edition of the Iron and Steel Works Directory. The two largest in the country, of 378,000 tons and 360,000 tons annual capacity respectively, as well as the fifth in size, with 342,000 tons annual capacity, are located in this one plant. The blast furnace with the third largest annual capacity is located at the Weirton, W. Va., works of the Weirton Steel Co., 356,400 tons being its annual theoretical output. Carnegie-Illinois Steel Corp.'s South Chicago works contains the fourth largest furnace with a capacity of 345,000 tons.

o o o

A blast furnace and refinery forge at Lynn, Mass., composed the first successful iron works to be established in the United States. The first successful attempt to make "sowe iron" in this country was there in May, 1645, while in September, 1648, this works completed satisfactorily the first effort to make "barr iron" from "sowe

iron" in a refinery forge. The works was abandoned about 1688 because of the frequency of lawsuits arising over the overflow of water in the dam.

o o o

A prospective advance in prices of Lake Superior iron ore of 25c. a ton or more will put these prices at the highest levels in many years. The lowest prices ever quoted for these ores were $2.60 a ton for old-range bessemer in 1897, $2.15 for Mesabi bessemer in 1895, $1.85 for old-range non-bessemer in 1898, and $1.75 for Mesabi non-bessemer in 1898.

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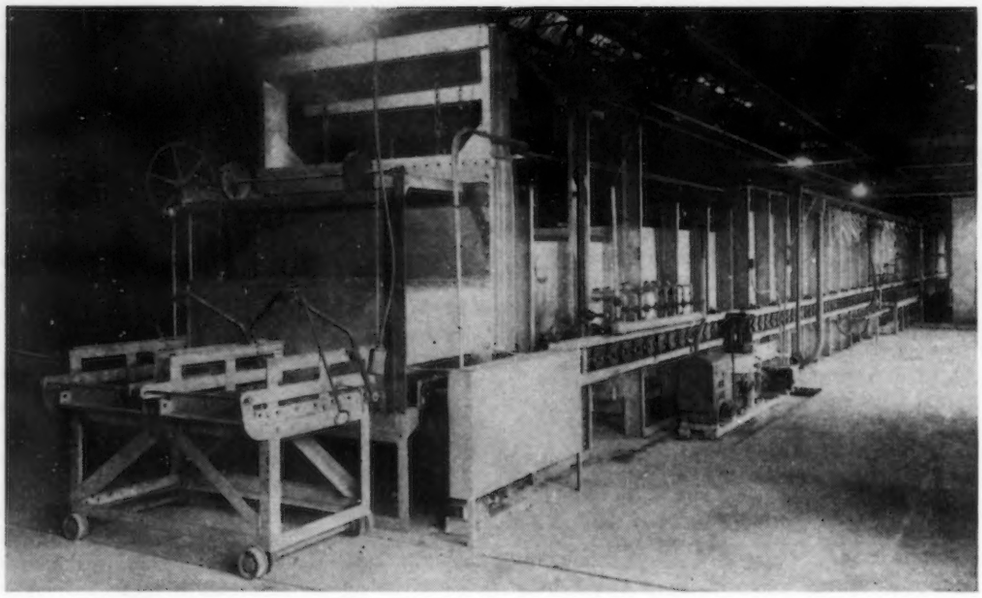
Even metallurgy in the U.S.S.R. is fringed with a halo of political idealism. The Russians have developed a great number of alloys, many of them being somewhat similar to those used in this country. However, their identifying names—Stalinite, Sormite, Pobedite, etc.—are taken from the political leaders or the originating plants. So far there is no Trotsky metal on record. Perhaps in time Russia's idealism may find a counterpart in this country. But even then the following names are unlikely: Lewis metal, C.I.O. flux, Rooseveltite, Murray alloy, etc.



o o o

DISCHARGE end of continuous furnace for handling short cycle special analysis malleable castings, showing cooling chamber, discharge vestibule or gas lock, the two-tray transfer car and dumping equipment.

o o o

Continuous Special Atmosphere Malleable Annealing Furnace

FOR short cycle annealing special analysis malleable castings used for some automobile parts a new type of special atmosphere continuous furnace was recently placed in operation in one of the leading foundries in the automotive field. The furnace, which is of the continuous roller hearth type, anneals 30 net tons of castings per day and operates on a cycle requiring approximately 13 hours in the furnace.

The castings are of miscelleneous shapes in both large and small sizes. They are loaded into alloy trays which travel through the furnace in two parallel rows directly on specially designed rollers which serve as the furnace hearth. No packing material is used for protecting the castings during the annealing cycle.

The trays are loaded on a loading extension at the charging end of the furnace. At a suitable time interval the charging door of the charging vestibule opens, and an auxiliary high speed drive mechanism rapidly charges the loaded trays into the vestibule. This door then closes and the door of the heating chamber automatically opens and the material is conveyed into the chamber. The material is then slowly and continuously conveyed through the heating and cooling chambers.

The trays, on reaching the discharge position, actuate a limit switch which automatically opens the discharge door and the castings are rapidly delivered to a gas lock chamber or vestibule. This door then closes and the material is moved out onto a two-tray transfer car and dumping equipment. The empty trays are placed on a gravity conveyor extending along the side of the furnace and are carried to the charging end where they are again loaded and the cycle is repeated.

The furnace is, of course, built gas tight. A special non-oxidizing atmosphere is used throughout the heating and cooling chambers and the castings are discharged from the furnace uniformly annealed and scale free.

This furnace has proved so successful for short cycle annealing that a duplicate furnace will be installed shortly in this foundry for the same purposes.

The special atmosphere used in the equipment is produced in an Elfurno gas generator located beside the furnace and which is part of the equipment.

The heating elements used are heavy, cast, nickel-chromium alloy grids located in both the roof and bottom of the heating and soaking chambers, above and below the material being heated. The heating elements are divided into seven separately and automatically controlled zones.

The furnace is approximately 120 ft. long and while it is designed to handle 30 tons per day and to operate on a 13-hr. cycle it may be designed for larger or smaller capacities and for other cycles, this being determined by the production requirements of the user and the kind or type of material to be annealed. The annealing cycle may range from 6 to 15 hours.

The complete equipment, including furnace, gas generator, dumping and other equipment, was designed and built by the Electric Furnace Co., Salem, Ohio.

Liberty Foundry to Make Alloy Castings

LIBERTY FOUNDRY CO., St. Louis, has put into operation a Pittsburgh 'Lectromelt furnace for making alloy castings. Norman C. MacPhee has been engaged as metallurgist and is in complete charge of the electric furnace operations. Mr. MacPhee has had wide experience in electric furnace melting and metallurgy and was formerly with Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich. Liberty Foundry Co. has also broken ground for an additional foundry building to cost $25,000.

Because of expansion of orders for rebuilt machine tools, the Simmons Machine Tool Co., Albany, has purchased the plant of the Capital District Foundry & Machine Corp., Green Island, N. Y. New equipment is to be installed in the Capital plant, which is expected to be ready for operation within 30 days.

C. J. DUBY
Chief Engineer
Republic Steel Corporation, Warren, Ohio

C. H. WILLIAMS
Assistant Chief Engineer
Carnegie-Illinois Steel Corporation
Youngstown, Ohio

W. B. SNYDER
Industrial Engineering Department
General Electric Company
Schenectady, N. Y.

M. H. MAWHINNEY
Consulting Engineer
Salem, Ohio

Steel Engineers Meet at Youngstown

THAT substantial progress has been made in furnace construction during the past 15 years was amply demonstrated by M. H. Mawhinney, Salem, Ohio, consulting engineer, when he presented a paper entitled "Industrial Furnace Design" before 700 members and guests of the Association of Iron and Steel Engineers at a national meeting in Youngstown, Ohio, Feb. 25.

Also of unusual interest was a detailed and comprehensive discussion of "Continuous Rolling of Hot Strip Steel" by A. F. Giese, Jr., general master mechanic, Carnegie-Illinois coke works, Gary, Ind. To those unfamiliar with the problems of rolling wide strip steel, Mr. Giese made it adequately clear that the lives of those responsible for strip production are filled with a series of "brow wrinklers." The discussion was, in reality, a complete case history of significant production records covering the operation of a Midwestern 79-in. hot-strip mill.

Another paper which brought forth considerable discussion was "Ward-Leonard Control for Blooming Mill Auxiliary Drives" by W. B. Snyder, industrial engineering department, General Electric Co. This particular talk covered the pioneering action of one large steel company in applying a principle to blooming mill operation, which heretofore has only been used on such equipment as flying shears, screw downs, skip hoists, etc.

After the morning session, which was under the chairmanship of C. J. Duby, chief engineer, Republic Steel Corp., Warren, Ohio, approximately 500 members and guests went on a tour of the Campbell works of the Youngstown Sheet & Tube Co. Although open hearth, power houses, blooming mill and control rooms were inspected, the center of interest was Sheet & Tube's hot and cold-strip mills. C. H. Williams, assistant chief engineer, Carnegie-Illinois Steel Corp., Youngstown, Ohio, was secretary of the Association's meeting.

Mr. Mawhinney's paper on furnace design gave an interesting account of the type of furnace used about 15 years ago. While it performed satisfactory under most demands at that time, it had no steel shell, insulation or controls and consisted of hardly more than a red brick receptacle, coal-fired and having a cumbersome and large side flue necessary to take off smoke and dirt.

Showing a series of slides depicting modern day furnaces, the speaker proved his point that phenomenal strides have been made to keep up with modern day requirements for heating steel. Various type heating units running from the one way fired and circular soaking pits to the latest design in annealing furnaces were described and illustrated by Mr. Mawhinney.

Particular attention was directed to the use of alloys in furnace construction. It was demonstrated that for those parts subject to stress or motion the standard practice is to use an alloy of about 35 per cent nickel and 15 per cent chromium, while equipment which is supported and is engaged in no movement, 12 per cent nickel and 25 per cent chromium is used. A slide showing a fan wheel made from alloy steel and subject to as high as 1400 deg. F. disclosed a thin section but which nevertheless in service performed extremely satisfactorily. The author noted the disposition on the part of some producers to carry the heavy casting idea over into alloy steel equipment, when in reality the structure could adequately fill the bill by the

(CONTINUED ON PAGE 84)

THIS WEEK ON THE ASSEMBLY LINE

. . . Total automotive output reached 115,360 units last week and should come close to 130,000 cars and trucks this week.

o o o

. . . January production of 399,426 cars and trucks was the largest figure for any January since 1929, despite curtailment of General Motors production.

o o o

. . . Production threatened by parts shortages as sporadic strikes continue to occur almost daily in Detroit.

o o o

. . . Tool and die program for 1938 models expected to be small, although machinery inquiries are active with increased production rather than mechanical changes the main urge.

DETROIT, March 1.—Production for the week ended Feb. 27 advanced almost 27,000 units over the figure for the previous week and came within shooting distance of the high levels registered in the middle of December, 1936, as General Motors plants began to reach their stride. Output for the week totaled 115,360 passenger cars and trucks in the United States and Canada, compared with 88,740 last week and 70,516 the corresponding week of 1936, according to Ward's Automotive Reports. General Motors volume rose to 36,700 units from 13,205 in the preceding week. Chrysler's output advanced a few hundred to 29,575 and Ford again made an advance of 1000 units to 30,825. By the end of this week General Motors should be operating close to capacity and production should benefit by another 10,000 to 15,000 cars.

Phenomenally fine weather throughout the nation has brought buying that is comparable to that of late March a year ago and is causing all the motor companies to keep production at an extremely high level. The fine weather has also tended to alleviate the perennial used car situation.

Labor Troubles Still a Threat

There still remains a serious threat of labor difficulty to automotive production. The signing of the General Motors truce was the signal for workers, both organized and unorganized, to agitate for higher wages, shorter hours and the elimination of piece work. As a result, during the last two weeks, sit-down strikes have been popping out all over town. The only reason they have not been a serious threat to assemblies so far is that most of them have been settled within a relatively short time and almost invariably to the advantage of the workers. By the end of last week, however, a sufficient number of parts plants had been affected to cause Plymouth to reduce its operations by 10 per cent. Incidentally, Plymouth itself just escaped a sit-down strike by a few hours by acceding to the demands of its workers as expressed through its works council. The threatened sit-down came when it was learned that the management intended to lay off approximately 10 per cent of the workers. An agreement was quickly reached on the basis of reducing the time of all workers 10 per cent. This incident points to two definite trends: one is the solidarity of the workers as expressed by their willingness to make individual sacrifices for the benefit of the group as a whole, and on the other side is indicated the loss of freedom of action on the part of management.

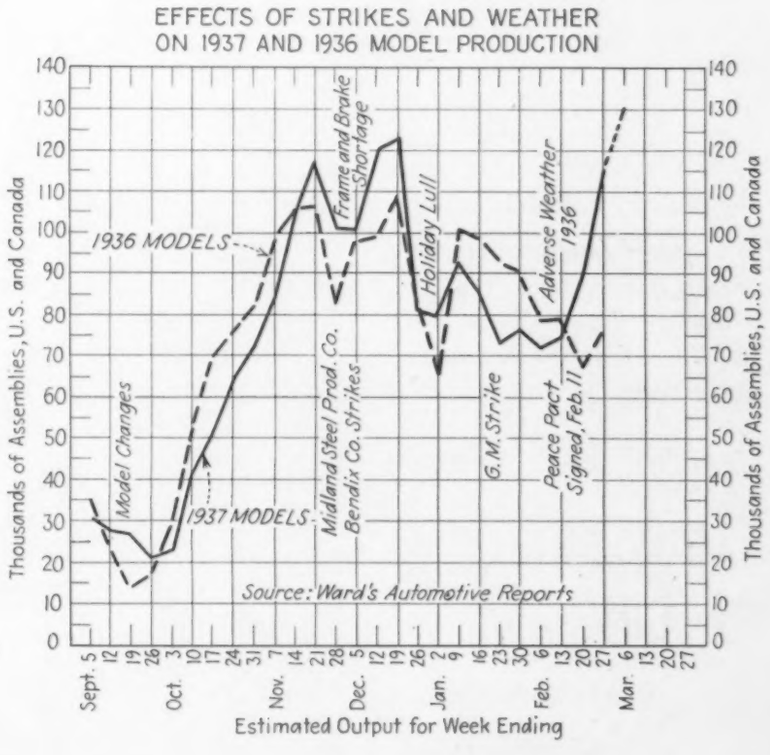
In fact, the whole present labor movement is in that direction, as is quite evident from the topics that

are under discussion between General Motors and officials of the UAW. As the conference drags on into its third week, it becomes apparent that many matters of general corporate policy will have to conform to the wishes of the organized workers' groups. As regards these negotiations, however, it looks as if there will be no compromise as between the 40-hr. week now being used by General Motors and the 30-hr. week demanded by the union. There is little heat behind this demand and it is felt that, if the matter were put to a vote of the workers, few of them would be in favor of cutting their time by 25 per cent. In all the sporadic strikes that have been occurring throughout the city, the settlement has been either on the basis of a 40-hr. or 44-hr. week.

Chrysler Bargaining This Week

Nothing has yet been definitely discovered about any agreements reached between General Motors and the UAW except that it is known that all of the points to be considered have been gone over in some detail. It is fairly evident, however, that whatever agreement is reached will be thrust upon the rest of the industry either through their voluntary action or by specific demands. Some feel that the General Motors discussions will be brought to a termination by Tuesday night, in order to permit the union to begin its bargaining with Chrysler on Wednesday morning. The situation at Chrysler, incidentally, is far different than at General Motors in that the plants are very well organized and there need be no strike to prove it. If the present trend is continued, however, it will not be long before General Motors plants are equally well organized. Since the strike began, the UAW claims to have increased its membership from approximately 100,000 to over 200,000. Many of these gains have been in plants like the A.C. Spark Plug Division that had been practically unorganized before the present settlement was made.

Detroit expects to see these sporadic strikes continue just as long as the present attitude is maintained on the part of the city, State and Federal authorities. No one expects to see a strong body of deputies march into any of the local struck plants and eject the sit-downers in the same way as was done at the Fansteel Metallurgical Corp. plant a Waukegan, Ill., and at the Douglas Aircraft factory at Santa Monica, Cal. The fact that the police commissioner of Detroit and the county prosecutor are at odds as to how the situation should be handled does not give further



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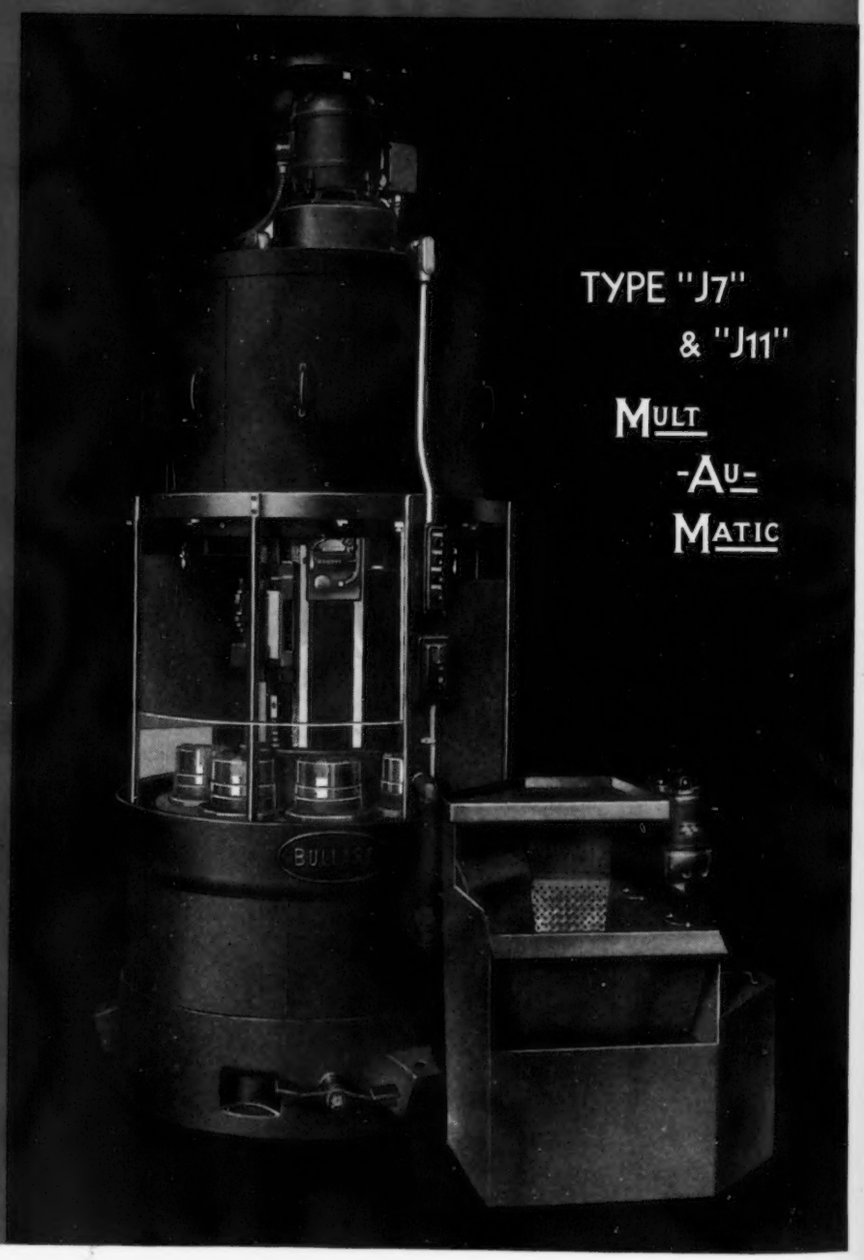

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

confidence to local manufacturers.

Among the automotive parts plants that have been affected in the last week are Timken-Detroit Axle Co., Ferro Stamping Co., Michigan Malleable Iron Co., Michigan Steel Castings Co., and the Detroit plant of Thompson Products, Inc. Thompson supplies 100 per cent of the steering gear tie rods and drag links to Oldsmobile, Buick and Hudson, as well as fractional requirements of Ford, Chevrolet, Pontiac and Packard. Bowen Products Co., another stamping plant, was able to persuade the strikers to leave its plant upon agreeing to negotiate the following Monday.

Auto-Lite Increases Pay

Electric Auto-Lite Co. in Toledo renewed its contract with the UAW on the basis of pay increases of 6c. to 8c. an hr. respectively for women and men employees. The new agreement was the result of several weeks' negotiation between the management and the union shop committee. Auto-Lite sales in 1936, incidentally, were 34 per cent over the previous year and, in spite of increase in wages and higher material costs, the company made a net profit of $4,196,768 contrasted with $2,595,387 in 1935. The company will retire all of its preferred stock on April 1, and with the aid of a $10,000,000 debenture bond issue will wipe out all bank loans.

The resumption of full production at General Motors plants has not helped the delivery situation in strip and sheet steel, which is now being quoted as high as 16 to 20 weeks. While there is no probability that General Motors will be hampered by material shortages, several mills have asked to be given the actual last-minute deadline on material in place of the originally designated receiving dates with their usual factor of safety. For the first time in many years, there is a sellers' market in strip and sheet, and mills are standing up and telling their customers when they can or cannot have the material despite any pressure that may be brought to bear. With steel coming in as it is at present, however, Chevrolet, for example, by the middle of this month will have enough material on hand to fabricate 150,000 jobs, which should carry Chevrolet through its April assemblies. With price changes expected momentarily, any new business is being accepted on the basis of the price at the time of shipment, which is expected to extend into the third quarter.

Die Program Late

Labor difficulties have tended to advance the start of the seasonal tool and die program for 1938 models. In fact, leaders in the jobbing industry do not know at the present moment just what sort of a program there will be. Practically no work has been let out, with the exception of some duplicate dies for Fisher Body and some fender dies for Packard, which is usually in the vanguard on model announcements. Since Fisher Body made such a drastic change last year in the elimination of composite wood and steel construction, it is not expected that there will be any material change in the body shell of any GM units this year. Instead, changes will be limited to fender revisions and front end styling.

Aside from the fact that the body programs will probably be small, local die shops are faced, as in previous years, with the threat of work going out of town owing to the high wage levels paid here. The average wage in tool and die shops at present is close to $1.10 per hr., with die sinkers making up to $1.45 an hr.

As far as the mechanical program is concerned, it is expected that there will be relatively few changes made in this direction either. In fact, the principal activity, as reflected in machine tool inquiries today, is along the lines of increasing production, reducing costs and improving accuracy. Both Plymouth and Chrysler divisions of the Chrysler Corp. are getting figures together on equipment to increase the present output of their cylinder block machining lines. There is also a great deal of activity across the river as Chrysler prepares to manufacture practically 100 per cent of the cylinder blocks for Dodge and Plymouth cars in Canada. Heretofore the motors have been built in the United States and merely assembled into cars in Canada.

Now that the labor situation is being clarified, General Motors is also taking an active part in machinery inquiries for several of its units. Cadillac is making some changes in the V-16 cylinder block and is lining up new equipment for its production. At the Cadillac plant General Motors is also planning to get into production on a Diesel truck engine. Chrysler also has developed a Diesel truck engine and it is expected that very shortly machinery will be purchased for its manufacture at the Dodge plant. This Diesel is a solid fuel injection type.

Ford Machinery Policy

Just as throughout the depression, Ford has continued to be the most important buyer of machinery in this district, despite unsettled labor conditions. While no drastic mechanical changes are anticipated, Ford has been buying production machinery largely to increase relative production on motor lines. Ford has also been particularly susceptible to new machin-

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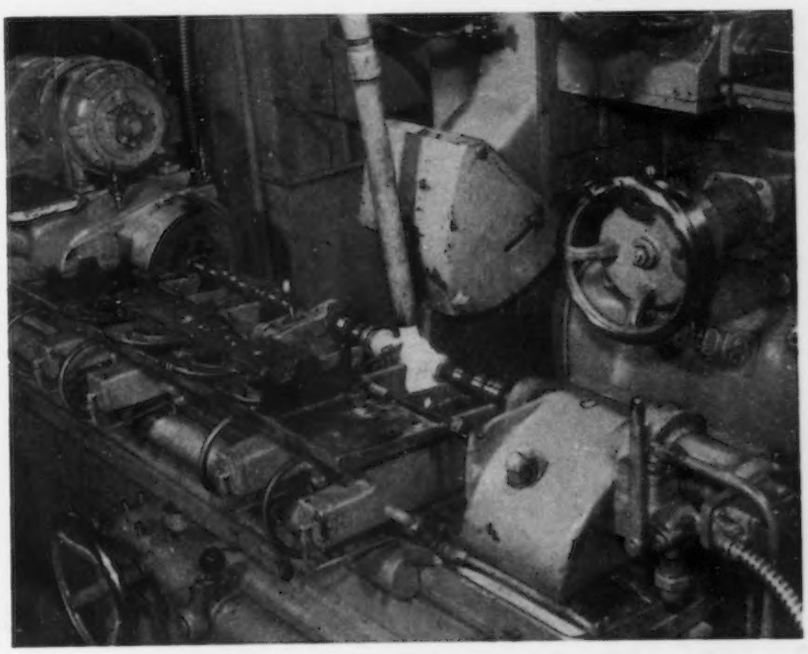


BUICK camshafts are brought to size within ± 0.0005 in. on this automatic Landis grinder. Wheel advance is controlled by an air caliper consisting of a V-shaped jaw with air jets. As the shaft approaches final size the jets are constricted, pressure is built up in a mercury column switch and the hydraulic feed is reversed.

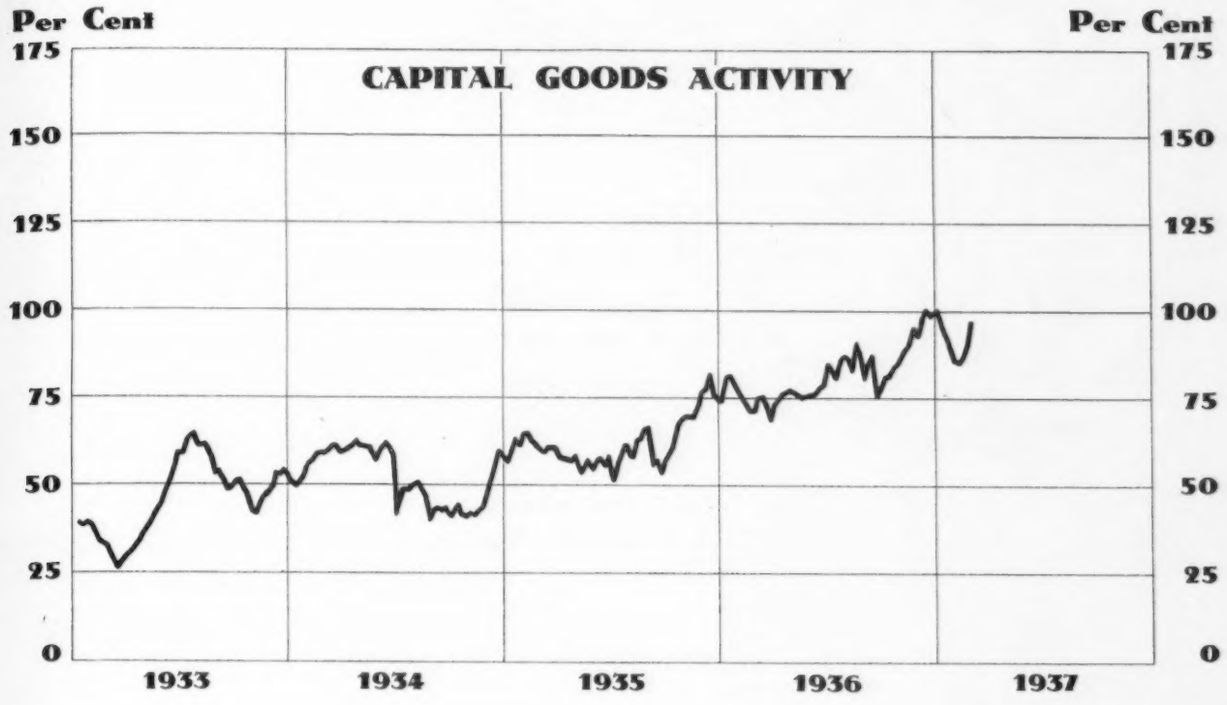
Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	January, 1937	December, 1936	January, 1936	Year, 1935	Year, 1936
Raw Materials:					
Lake ore consumption (gross tons)[a]	4,694,312	4,551,379	2,951,568	30,857,862	44,639,318
Coke production (net tons)[b]	4,629,532	4,608,655	3,450,342	35,141,261	46,317,087
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	3,211,500	3,115,037	2,025,885	21,007,802	30,618,797
Pig iron output—daily (gross tons)[c]	103,597	100,485	65,351	57,556	83,658
Castings:					
Malleable castings—production (net tons)[d]	.....	61,674	48,198	456,395	571,696
Malleable castings—orders (net tons)[d]	.....	67,035	43,852	452,611	576,334
Steel castings—production (net tons)[d]	.....	83,615	44,298	398,988	805,691
Steel castings—orders (net tons)[d]	.....	159,430	59,019	400,157	909,080
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	4,736,697	4,431,645	3,045,946	33,417,985	46,919,362
Steel ingot production—weekly (gross tons)[e]	1,069,232	1,002,635	687,572	640,928	897,463
Steel ingot production—per cent of capacity[e]	81.42	77.66	51.40	48.54	68.52
Finished Steel:					
Trackwork shipments (net tons)[a]	7,246	5,579	3,366	42,229	68,813
Steel rail orders (gross tons)[a]	25,700	125,290	208,541	533,120	1,053,230
Sheet steel sales (net tons)[f]	.....	336,758	174,805	2,473,489	2,720,330
Sheet steel production (net tons)[f]	.....	230,581	223,000	2,424,990	2,598,140
Fabricated shape orders (net tons)[g]	130,651	166,542	120,364	1,068,603	1,609,016
Fabricated shape shipments (net tons)[g]	92,020	121,775	79,995	1,095,216	1,548,205
Fabricated plate orders (net tons)[d]	.....	51,017	38,709	258,315	484,038
Reinforcing bar awards (net tons)[e]	10,220	18,550	62,210	318,340	334,790
U. S. Steel Corp. shipments (tons)[h]	1,149,918	1,057,365	721,414	7,371,299	10,825,132
Ohio River steel shipments (net tons)[i]	96,400	111,450	65,760	926,174	1,169,321
Fabricated Products:					
Automobile production, U. S. and Canada[k]	399,426	519,132	377,306	4,119,811	4,616,857
Construction contracts, 37 Eastern States[l]	$242,844,000	$199,695,700	$214,792,800	$1,844,544,900	$2,675,296,000
Steel barrel shipments (number)[d]	.....	895,481	542,597	6,872,452	8,600,493
Steel furniture shipments (dollars)[d]	.....	$2,112,972	$1,586,446	$15,523,579	$19,245,935
Steel boiler orders (sq. ft.)[d]	.....	1,872,139	623,364	6,245,158	11,511,557
Locomotive orders (number)[m]	46	112	14	87	533
Freight car orders (number)[m]	10,881	19,035	1,050	18,699	67,544
Machine tool index[n]	200.3	257.7	110.8	†99.9	†201.7
Foundry equipment index[o]	190.9	283.3	127.0	†119.5	†224.9
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	52,584	50,489	470,015	666,838
Imports of pig iron (gross tons)[p]	.....	10,423	15,036	130,937	165,909
Imports of all rolled steel (gross tons)[p]	.....	19,968	22,958	216,628	270,594
Total iron and steel exports (gross tons)[p]	.....	244,156	241,564	3,063,505	3,162,694
Exports of all rolled steel (gross tons)[p]	.....	126,173	79,100	897,883	1,167,244
Exports of finished steel (gross tons)[p]	.....	117,979	74,254	767,590	1,040,815
Exports of scrap (gross tons)[p]	.....	103,026	153,906	2,044,505	1,881,983
British Production:					
British pig iron production (gross tons)[r]	650,700	671,400	595,500	6,426,400	7,685,600
British steel ingot production (gross tons)[r]	998,900	1,019,200	912,500	9,842,400	11,706,300
Non-Ferrous Metals:					
Lead production (net tons)[s]	43,636	47,085	36,296	421,764	463,187
Lead shipments (net tons)[s]	45,718	51,646	34,590	433,456	512,975
Zinc production (net tons)[t]	40,025	47,050	41,917	431,499	524,271
Zinc shipments (net tons)[t]	50,638	59,821	46,468	465,746	563,273
Deliveries of tin (gross tons)[v]	7,615	6,930	6,635	59,110	74,005

† Three months' average.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of Census; [l] F. W. Dodge Corp.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.



THE IRON AGE Weekly Index Numbers of Capital Goods Activity
(1925-27 Average = 100)

Last week	97.0	Same week 1933	32.3
Preceding week	90.3	Same week 1932	39.4
Same week last month	85.9	Same week 1931	70.4
Same week 1936	70.9	Same week 1930	97.2
Same week 1935	60.2	Same week 1929	123.1
Same week 1934	58.8		

THE course of business improved substantially last week. There were increases in all five of the components which form THE IRON AGE's weekly index of Capital Goods Activity, and the index advanced sharply to 97.0 per cent of the 1925-27 average from but 90.3 in the week before. This was a gain of 6.7 points or 7.4 per cent, while relative to the corresponding week a year ago it was a gain of 26.1 points or 36.8 per cent.

The five industrial series combined by the general index not only rose in each instance during the week, but in each case increases were more than seasonal. Steel mills expanded operations to 83 per cent of capacity, and automobile output soared to 115,360 units assembled, or 26,620 more than in the preceding period. New heavy construction contracted for totaled above $72,000,000, nearly $30,000,000 over the volume of the previous week. Lumber freight moved by the railroads forged further ahead, and in the Pittsburgh district industry also increased its tempo. The actual operations for the week of each of these series, together with changes from the preceding week, are given below.

During February, the combined activity index averaged 89.8 per cent of the 1925-27 average, contrasted with 91.7 for January and 72.6 for February, 1936.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	83	+½
Automobile production (number of cars and trucks)	115,360	+26,620
Railroad loadings of forest products (number of cars)	37,111	+1,811
Pittsburgh industrial production and shipments (index number)	111.8	+2.9
Construction contracts awarded (total value)	$72,178,000	+$29,620,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

WASHINGTON. . . . . .

. . . Representative Ellenbogen introduces bill to provide for sweeping inquiry of steel industry in effort to determine "an effective public policy toward the industry."

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. . . Basing point system would again be an issue; Bureau of Business Research report does not agree with position taken by Federal Trade Commission and exemplified in Senator Wheeler's bill.

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By L. W. MOFFETT
Resident Washington Editor, The Iron Age

o o o

WASHINGTON, March 2.—Seizing upon suggestions in a recent report of the Bureau of Business Research of the University of Pittsburgh, Representative Henry Ellenbogen, liberal Democrat, of Pittsburgh, has introduced a House resolution to determine "an effective public policy toward the iron and steel industry, as it (House of Representatives) may deem meet and appropriate." Whatever may eventuate from the resolution, clearly it opens wide the possibilities of attempted Federal regimentation, if not socialization, of American industry, particularly the country's basic industries, comprehending a control far and beyond that which was so substantially attained under the now invalidated NRA. Probably actual achievement of such broad Government control of the nation's industrial policies is only a dim prospect, but the fact that legislation looking to this end has been introduced in one branch of Congress is a matter of serious concern.

Representative Ellenbogen, who comes from the world's greatest iron and steel producing district, told THE IRON AGE that his resolution had not been introduced in a spirit of unfriendliness toward the iron and steel industry. On the contrary, he contended that the industry ought to encourage and cooperate in the sweeping inquiry the resolution seeks into the economic, merchandising and labor policies of the industry as a means of settling the conflict over what was called the Government policy with reference to the industry. Mr. Ellenbogen said that he proposed to sound out iron and steel executives in order to get their views regarding his resolution. Nationally, Mr. Ellenbogen is best known as author of a bill to set up an NRA for the textile industry and his support of other organized labor legislative proposals.

Committee of Five Proposed as an Inquiry Board

His resolution to investigate economic conditions in the iron and steel industry has been referred to the House Committee on Rules. Mr. Ellenbogen said it is his purpose to press the resolution, seeking to have the committee report out a rule for its consideration. It calls for the appointment of a Congressional committee of five, according to a statement issued by Mr. Ellenbogen, to determine "whether the previous Government policy, as expressed in the anti-trust laws, with reference to the iron and steel industry, is in harmony with the public interest or represents," as the Bureau of Business Research said, an "unrealistic approach to the economics of the industry." The resolution provides that this subcommittee be selected by the chairman of the House Committee on Interstate and Foreign Commerce. Representative Clarence Lea, Democrat, of California, is chairman of the committee. The subcommittee would be selected from the Interstate and Foreign Commerce Committee.

Under the direction of this subcommittee therefore a searching, long-drawn out inquiry, with a vast array of witnesses, going into all phases of the iron and steel industry, would be undertaken. It would go into the economic conditions under which iron and steel is manufactured, priced and merchandised, costs of production of all materials, raw, semi-finished and finished, "need for and economic justification of the basic (sic) point system, existence of monopolistic practices, if any," need for effec-

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICE HUBBARD, OHIO

tive regulation or supervision, "if any," over prices, cost and conditions of labor, relations between management and labor in the industry "and the labor problem in all its phases, including those which effect management, employees, stockholders, and the consuming public, and the relations of these to the economics of the iron and steel industry."

Resolution Would Give Power of Subpoena

While the resolution differs from the proposal of the Bureau of Business Research in that the investigation would be conducted by a political subcommittee rather than by an impartial Federal commission, it provides for consultation with and employment of experts. They would include accountants, engineers and investigators who could be selected at the discretion of the subcommittee. The bureau proposed that such experts be familiar with the technique of the iron and steel industry. The force of the resolution to compel complete disclosure of the most minute details of operations of the industry and its individual companies is indicated by the fact that it would give the subcommittee the power of subpoena of witnesses and company records. Testimony would be given under oath.

President Roosevelt has asked that he be supplied with a copy of the Bureau of Business Research report, but it has not been indicated whether or not he has had time to go over it, or what his conclusions may be, if any, as to making it the basis for a legislative policy as to the iron and steel and possibly other industries. Should he interest himself to the extent of deciding upon such a policy, which might or might not parallel the suggested lines of the report, the Ellenbogen resolution apparently would be inadequate as an administration measure. The resolution would confine the proposed investigation to only one branch of Congress. It is to be assumed that an administration-supported inquiry, if made by legislators, would be made up of a joint subcommittee of both the House and the Senate. The Bureau of Business Research proposed that recommendations by the contemplated impartial Federal commission be made to Congress as a whole, not to any single branch.

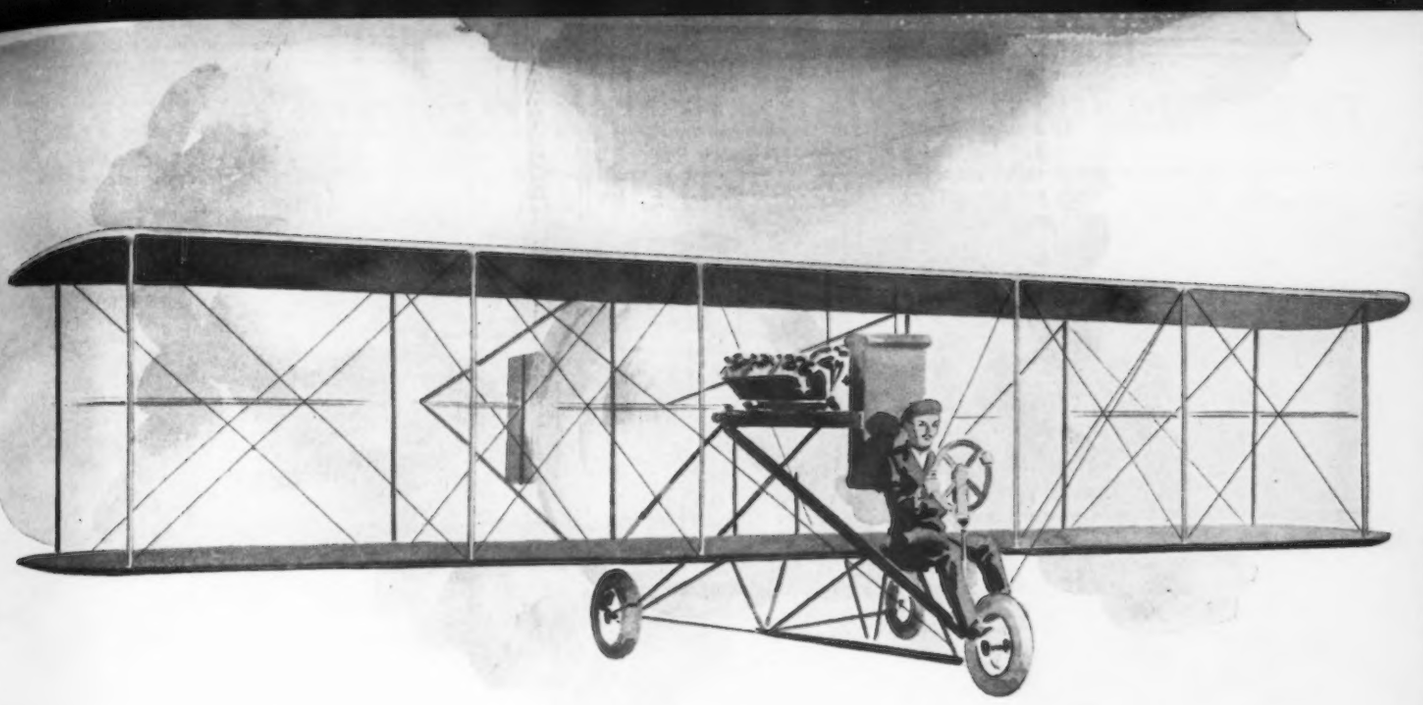
So far as the administration is concerned, there is nothing definitely to suggest that it proposes to ask for legislation of the kind which the resolution implies. It may or may not do so. The President has given no intimation as to what, if anything, he might do, though he has manifested an interest in the Bureau of Business Research report.

Basing Point System Would Be an Issue Again

It is certain that if the Ellenbogen resolution resulted in legislation of the kind it contemplates the present so-called Government "policy," as Ellenbogen called it with reference to the iron and steel industry, would be abruptly changed. In reality the Bureau of Business Research speaks in guarded terms inasmuch as it refers to the "traditional *attitude* of the Government, as it has been expressed in the anti-trust laws and by the Federal Trade Commission." It is an attitude, not a policy. The attitude of the Federal Trade Commission, which proposes an f.o.b. mill pricing system, is condemned by the Bureau of Business Research as being "inconsistent with the economics of the steel industry and therefore in the long run doomed to futility." At the same time the report condemns the basing point system as developed under the steel code. In short, it calls for a broad investigation in order to reach recommendations for Federal action to determine a price policy. Definitely this would mean Government control of the price problem, at least of the iron and steel industry. Control of the price problem may be considered as being equivalent to control of the iron and steel industry and Governmental penetration toward control of all industry—assuming the Constitution so permitted. The bureau report does make the solacing declaration that "some form of basing point system with the right to absorb transportation to meet competition is required for most tonnage-steel products."

The Federal Trade Commission attitude is reflected in the Wheeler anti-basing point bill. Senator Wheeler recently reintroduced the bill. The President has never indicated publicly whether or not he favors the FTC position, which is specifically reflected in the Wheeler bill.

Mr. Ellenbogen said he had no fixed notions as to the basing point system. He stated, however, that it is his opinion that if such legislation as the Wheeler bill proposes were brought before the House it would pass easily. Mr. Ellenbogen also admitted that he had not familiarized himself with the principles



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of the basing point system. He said he had not even read hearings on the Wheeler bill which were conducted by Senator Wheeler, as chairman of the Committee on Interstate Commerce, during the previous session of Congress. In the course of the hearings steel executives exhaustively set forth their views on the basing point system and strongly opposed the Wheeler bill.

Aside from the pricing problem in the steel industry, the bureau report discusses the labor problem and recommends the vertical form of unionization. Unquestionably this question would share prominently in the inquiry which Mr. Ellenbogen proposes.

President's NRA Report Generally Favorable—A New Law is Likely

WASHINGTON, March 2.—The President today submitted to Congress a special report of the Committee on Industrial Analysis, which was set up one year ago to study the effect of the invalidated National Recovery Act, making a preliminary move toward legislation setting up standards of hours and wages together with trade practice agreements. They are expected to be proposed in separate measures, and to take on a form considerably revised from the old NRA set-up. This view is reached by reason of the critical attitude of the committee report on NRA.

In a brief message accompanying the report, President Roosevelt said that he is of the opinion that the report will point to the solution of the many vexing problems of legislation and administration in one of the most vital subjects of national concern.

"The report," said the President, "should furnish invaluable aid to Congress in the consideration and determination of vital legislative problems.

"It is worthy of the most serious consideration by Congress, and should be made available for widespread study and discussion."

Like the report itself, the President's message made no recommendation. Clearly, however, it was a forerunner to proposed legislation by the administration. Such legislation, however, is not expected to be offered for a month or longer, pending action by Congress on the President's plan to reorganize the Federal judiciary.

NRA Helped Labor

The committee in a unanimous report finds that NRA attempted too much, but generally upholds its principles. No recommendations were made in the report, nor were the multiplicity of codes reported on separately; they were treated collectively as to their principal aspects.

The committee said that the public support given by NRA to the principle of freedom of labor to organize and bargain collectively was of great and probably lasting importance, out of proportion to the immediate and tangible results secured.

The committee said that it is not possible to answer statistically the question whether NRA did or did not contribute to industrial recovery, "which did make evident progress during the NRA period."

The report states that some of the trade practice provisions intended to raise prices, to stabilize prior price increases or to reduce accumulation of inventory, but failed to accomplish their intended effect. But some of these "failures," it was declared, may really have been moderate successes from the standpoint of general national recovery.

"NRA attempted to cover more

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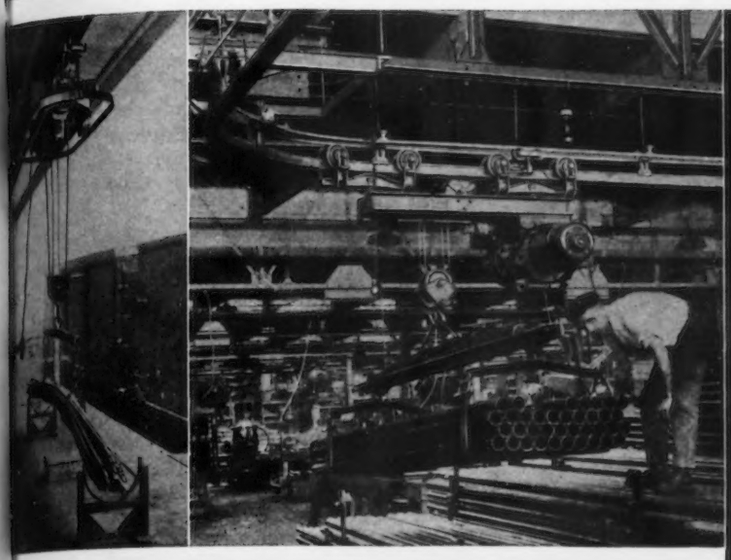

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ground, and at greater speed than could possibly be covered effectively; and its whole program was colored by this fact, and by other facts closely akin to it," the report says.

"Both management and labor went too far, with the result that many impracticable and unenforceable provisions were put into the codes to the detriment of the more worth-while provisions.

"The apparently simple conception of fixing maximum hours, minimum wages, and minimum price provisions, developed wholly unexpected degrees of complexity."

Coordination Necessary

The committee points out that considerable parts of American industry are not organized adequately for cooperative action and that the boundaries between industries are not sharply defined so that overlapping of codes and conflicts of authority not only embarrassed the work of NRA, but that difficulties of this nature "should be recognized as inherent in any attempt to produce a variety of programs initiated by particular industries and directed at their special problems," so that "the thing that has to be guarded against is a lack of coordination in the program as a whole, particularly in the trade practice field."

It was stated that many rules made, and which were supposed to have the force of law, were wholly devoid of the elements that make a law.

Commenting on standards to guide policy, the committee said: "Both for legal and for economic reasons, any program similar to that of NRA needs more definite standards than NRA possessed, and the important question concerns standards for any future action of this sort that may be taken."

Regarding hours, the committee said that the normal standards should be the most effective balancing of the workers' time between producing more goods and enjoying more leisure. The workers' increased economic power, which naturally comes with increased production, it is stated, would normally be divided between these two ends. This means that, whenever more goods would be worth more to the worker than more leisure, hours should not be shortened. The necessity of shortening them below this standard, the committee said, is a confession of failure in the economic system.

"It may still need to be done temporarily, in emergencies," said the report, "but if an emergency standard of the work-spreading sort persists into more normal times, it may act to limit production instead of merely to spread work and so may do real harm.

Standards for a permanent policy should be formulated in the light of a candid examination of these possibilities."

Minimum Wage Beneficial

As to wages, the committee said it accepts the tentative finding of the National Recovery Board that a minimum wage can be socially beneficial not only as a safeguard to the worker but also as a wage-floor for the cooperation of the competitive system. But in this field, code experience developed or implied the need for well-considered standards, which would be even more necessary to a long-run policy. The committee pointed out that there is need for greater simplicity and uniformity than NRA achieved, combined with flexibility and safeguards both for labor and for employers who comply with wage requirements.

The committee said that the experience of NRA indicates that if trade practice rules are to be formulated, "they should be initiated by the industries, that is, by the men who know most about the problems of the industry and who have to apply them in actual practice."

However, that such rules, "proposed for the approval of a governmental board, would be regarded with suspicion or perhaps would be considered only in exceptional cases, unless they had passed through an advisory board or a composition like that of the final NRA policy board, which was represented by management, labor and consumers."

The board stated that it also seems that if any relaxation of the anti-trust laws is contemplated to permit trade agreements intended to coordinate the practices of competing business within the field that has been referred to as "stabilization," the decision to make such relaxation should be by legislative action. Any administrative body empowered to review and to approve such trade agreements, the report said, should be expressly authorized by Congress to approve agreements within that field.

"Finally," said the report, "while labor and trade practice aspects of an industry program are definitely related in many ways and should be considered, NRA experience indicates that separate administrative bodies should be provided for negotiation and for compliance activities, both in the field of labor provisions on the one hand and of merchandising problems on the other."

The committee consisted of Prof. John M. Clark, Columbia University; William H. Davis, of the

New York law firm of Pennie, Davis, Marvin and Edmonds; George M. Harrison, president of the Brotherhood of Railway and Steamship Clerks, and George H. Mead, president of the Mead Corp., Dayton, Ohio.

Lincoln Electric Co., Cleveland, has appointed N. B. Gilliland to the sales engineering staff of the Detroit office, 2457 Woodward Avenue. Mr. Gilliland was assistant instructor of welding at Ohio State University for a year.

Swedish Steel Industry Prospering

STOCKHOLM (*Special correspondence*).—The Swedish iron and steel industry enjoyed record prosperity in 1936, according to statistics just released here. Prices are rising, but raw material costs are rising at an even more rapid rate. Iron and steel exports increased from 276,000 tons in 1935 to 310,000 tons. The Swedish consumption of iron and steel is estimated at 953,000 tons, an increase from 1935 of 15.7 per cent. The number of workmen employed in the iron industry during 1936 rose by about 2000 to 27,387. Owing to this prosperity, a great number of extensions and modernizations are being made at iron and steel mills.

$5,000,000 Additional Needed For Drydock

WASHINGTON, March 2.—Request has been made of the Bureau of the Budget by Secretary of Navy Swanson for an increase of $5,000,000 in the present appropriation of $10,000,000 for construction of a huge floating drydock to be stationed at Honolulu. A private bid to build the drydock was made last fall and greatly exceeded the appropriation as did Navy yard estimates which were also presented to the Navy Department.

Interior Department Awards Dam Contracts

WASHINGTON, March 2.—Secretary of the Interior Ickes has awarded contracts totaling $1,786,379.94 for the manufacture and delivery of 24 sets of 102-in. control gates and appurtenances for Marshall Ford Dam, under construction by the Bureau of Reclamation on the Colorado River in Texas. The S. Morgan Smith Co., York, Pa., will deliver eight gates for $608,211.14, the Bartlett-Hayward Division of Koppers Co., Baltimore, eight for $616,683.20, and the Hardie-Tynes Mfg. Co., Birmingham, eight for $561,485.60.

German Exports of Steel Gained in 1936

LONDON (*Special correspondence*).—Germany's iron exports during 1936 are officially stated to have increased by 354,000 tons to 2,722,000 tons. In value the exports were 45,500,000 marks higher at 314,000,000 marks. The exports to the United Kingdom amounted to 93,000 tons, against 63,000 tons in the preceding year.

Shortening Hours Not the Way Out

POINTING out that production is still some 10 per cent below the level of 1929 and, figured on a per capita basis, 15 per cent below, Dr. Harold G. Moulton, president, the Brookings Institution, Washington, D. C., in making a report on "The Recovery Problem in the United States" before friends of the Falk Foundation at Pittsburgh, Feb. 15, said that we cannot have former standards of living until output per capita is again equal to that of pre-depression days.

Dr. Moulton was discussing the findings of a study on recovery problems in the United States that was recently concluded by the staff of economists of the Brookings Institution. The study was financed through a grant by the Falk Foundation.

According to Dr. Moulton, the essential requirements for a consistent program of further recovery could be summarized as follows:

1. The reestablishment of a balanced federal budget as a foundation on which to build enduring progress.
2. The continuance of the present policy of maintaining a fixed price of gold and the establishment through international cooperation of a system of stable foreign exchanges.
3. The extension of the program of reciprocal trade agreements as the most practical means of reducing artificial barriers to commerce and reopening the channels of international trade.
4. The preservation of the generally favorable ratio of prices and wage rates, in the interest of progressively expanding the real purchasing power of workers and creating a demand for added production and employment, placing emphasis upon price reductions as a means of carrying the benefits of technological progress to all groups within the nation.
5. The maintenance, in general, of prevailing hours of labor, as the only means of meeting the production requirements involved in restoring during the next few years the standards of living of the laboring masses and promoting the economic advancement of the nation as a whole.
6. The elimination of industrial practices and policies, private and public, which tend to restrict output or to prevent the increase of productive efficiency.
7. Shifting the emphasis in agricultural policy from restricted output and rising prices to the abundant furnishing of the supplies of raw materials and foodstuffs required by gradually expanding markets.

Dr. Moulton touched upon a subject which has been engaging the attention of industrialists and social educators; namely, the necessary and desirable length of working hours. According to him, there has recently been evolved as an outgrowth of the unemployment situation, a policy regarded by its exponents as of vital significance to labor. It has been enunciated as a definite principle that working hours should be reduced at the present juncture sufficiently to absorb all the existing unemployment and that henceforth they should be systematically reduced in proportion to further increases in productive efficiency. In attempting to answer the question as to what the economic results of such a policy would be upon living standards and its bearing upon recovery, Dr. Moulton said:

Production is Wealth

"The advocates of this principle are apparently quite unconscious of its implications from the standpoint of production. The confusion of mind arises from concentration of attention upon money income to the exclusion of everything

else. What is seen is that if the working week is shortened sufficiently to absorb unemployment, but without any reduction in weekly wages per person, the total volume of money flowing to the laboring population would be increased. What is not seen is that the expenditure of this increased money income in the markets would not bring forth any larger volume of goods and services—since the very process by which the increased volume of money income is made available prevents any increase in production. We would have on the one side an increasing flow of money into trade channels; but on the other side a flow of goods and services of unchanging magnitude. The certain outcome would be rising prices. By the very nature of the plan real income—in terms of goods and services—would have to remain stationary. Labor would merely obtain increased leisure.

"It is also assumed that this plan assures, in any event, a more 'equitable participation in the output of industry.' Even the most 'equitable' distribution of a fixed and limited national income of 60 billion dollars would not enable labor to obtain any significant increase in real wages. If the profits of 1936 had been completely diverted to employees, the increase accruing to each working-class family would be less than $150. It is, moreover, by no means certain that the plan would lead to an increase in wages at the expense of profits. The rise in prices might leave profits much the same as before.

"The adoption of this plan as a means of absorbing present unemployment would, however, undoubtedly lead to a different distribution of real income among the laboring groups themselves. Those who would secure employment as a result of the scheme would, of course, receive an increase in money income and in real purchasing power. On the other hand, those who now have jobs would find their real purchasing power reduced as a result of rising prices. Putting the matter more directly, since a larger number of workers would have claims against an unchanging volume of production, the share going to labor now employed would inevitably be reduced. The salaried and fixed income groups, together with the 30,000,000 people constituting the agricultural population, would likewise be adversely affected.

A New Depression

"Because of the sharp increases in costs that would be entailed, legislation requiring a universal shortening of the working week would be certain to halt the present recovery movement and precipitate a new period of reaction. The interests of labor quite as much as those of the employer demand that hours of labor be adjusted in the light of production and consumption requirements rather than for the purpose of absorbing unemployment.

"It is sometimes alleged that the real objective of the short work week is not so much to reduce actual working hours as to place labor in a position to exact extra pay for overtime, computed on a shorter standard week. Hence, it is argued that the shorter work week would not necessarily mean a smaller volume of work performed, though it would mean larger money wages. It is obviously true that a 30-hour regular week plus ten hours of overtime would actually be the equivalent

of 40 hours of work. But it does not follow that this would increase the standard of living of labor in general. This is because no increase in efficiency would result from the process. The increase in wage costs would promptly lead to an effort to recoup the added outlays through advancing prices. It may be recalled that this is precisely what occurred under the NRA program of forcing shorter hours with a view to increasing wage rates. Here and there, in highly profitable enterprises, the increased costs might be absorbed without proportionate increases in prices; but in the great majority of cases this would result either in advancing prices or crippled operations and the discharge of labor. In short, the further reduction of working hours would prevent the rise in standards of living which are so essential to the welfare of our people.

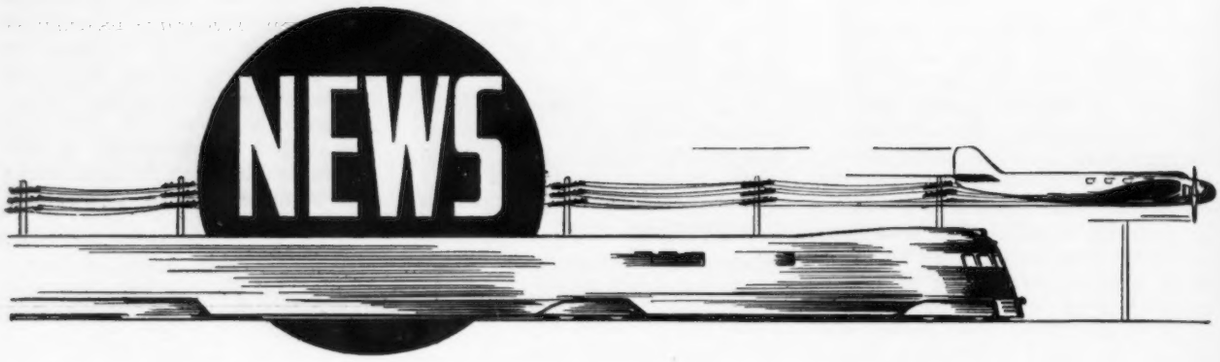
"If the principle of reducing hours in proportion to increases in productive efficiency had been in operation between 1900 and 1929 it would have meant that all of the gains resulting from the increase in productive efficiency would have had to be realized in the form of greater leisure—none in the form of higher standards of living. If such a plan where to be put into operation now with a view to absorbing existing unemployment it would mean that the volume of national production would be frozen at its present low level—concretely at about $470 per capita. If the principle of reducing working hours in the future in direct proportion to increasing efficiency were adopted and enforced there could henceforth be no increase in production per worker or in living standards."

British Mills Reach Agreement on Scrap

LONDON (*Special Correspondence*).—The British Iron and Steel Federation has issued the following statement:

"In view of the urgent need for the conservation of raw materials to meet the general demand for steel, including Government requirements, steel makers, through the National Federation of Scrap Iron and Steel Merchants, have reached an arrangement for the supply of all available scrap at economic prices. It is expected that this arrangement will result in the immediate release of any scrap which may have been held up in anticipation of a rise in prices."

It is understood that the phenomenal world demand for raw material, which resulted in foreign buyers entering the British scrap market, was a factor that resulted in negotiations being opened between the two bodies mentioned above. Steel works had complained that, owing to the influence of foreign buyers, prices demanded for scrap were altogether uneconomical for them. It was suggested that an agreement on unified control between the steel works and scrap merchants would meet the situation.



E. T. Weir Takes Issue with Research Bureau's Conclusions

E. T. WEIR, chairman, National Steel Corp., has taken issue with the conclusions presented by the authors of the recently summarized study, "The Economics of the Iron and Steel Industry," made under the supervision of the Bureau of Business Research, University of Pittsburgh. Abstracts of a few of the findings appeared in the Feb. 18 issue of THE IRON AGE.

Mr. Weir pointed out that in presenting his address, Mr. Watkins, director of the Bureau of Business Research, said that the study was not the pronouncement of any scientific body, nor did it carry any indorsement by anyone except the authors. In commenting on the validity of the study, Mr. Weir said that it was the first time to his knowledge that opinions of such a controversial nature were ever published under the name of any research body with the qualifications expressly stating that the entire responsibility for each opinion rested in one case on two men, and in the other case on one man. Especially did he disagree with the recommendations based on the conclusions in the study, namely, that the steel industry be regarded as a monopoly requiring Government regulation, and that the workers in the steel industry be grouped into a labor monopoly in the form of a national union (although in this case Government regulation is not suggested).

Following the discussion of the iron and steel study, Mr. Weir disclosed the fact that employees of the National Steel subsidiaries have opened negotiations with management for a wage increase, but have not set a definite figure. On the current subject of the steel industry working on a 40-hr. week, it was Mr. Weir's opinion that under present conditions this could not be done on an industry-wide basis and that one of the main factors prohibiting such a work week was the shortage of skilled workmen, in addition to the continuous operation set-up in the steel industry and the heavy current demand for steel products.

Mr. Weir's statement in full follows:

"Following the Falk Foundation dinner on Monday evening, Feb. 15, I was asked by newspapermen to comment on the address delivered on the occasion by Dr. Ralph J. Watkins, director of the Bureau of Business Research of the University of Pittsburgh. Dr. Watkins spoke on 'The Economics of the Iron and Steel Industry,' and in the

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address he reported on the study of the same title that was made under his supervision. I declined to comment then because I did not wish to give a snap judgment.

"As I said after hearing the address, 'every man is entitled to his own opinion,' and until the book containing the full report is published, I can make no comment upon the evidence given to support the statements made in the address. However, the address itself has gained wide publicity; it is possible of analysis and since it was so adversely critical of the steel industry it should be analyzed.

"I am a member of the board of managers of the Falk Foundation, which helped to finance this study, but in this statement I am not seeking to commit any of the other members of the board. I speak as a steel man and as an individual.

"Dr. Watkins' address expressed the opinions of individuals on controversial subjects. It showed—in fact, Dr. Watkins carefully pointed out—that it was not the pronouncement of any scientific body, nor did it carry any indorsement by anyone except the authors.

Report Shows Only Opinions of Individuals

"It is the first time, to my knowledge, that opinions of such a controversial nature were ever published under the name of any research body with the qualification expressly stated that the entire responsibility for each opinion rested in one case on two men and in the other on one man. After the facts are assembled, it is the usual practice in such a project to have the entire organization study all of the data to determine the considered judgment of the group, as a group, before presenting any conclusions. Any other method deprives the conclusions of all weight except that given by the reputation and ability of the one man who may write any given section of the report. In this report, apparently, Dr. Stratton and Dr. deChazeau are solely responsible for the study and conclusions of the economic section of the report, and Dr. Daugherty is solely responsible for the study and conclusions of the labor section.

"The character of the opinions expressed in this address is emphasized by the recommendations based on the conclusions. These set up as a desirable goal for the country the establishment of two monopolies, as follows:

1. That the steel industry be regarded as a monopoly requiring Government regulation.
2. That the workers in the steel industry be grouped into a labor monopoly in the form of a national union (although in this case Government regulation is not suggested).

"Can there be any doubt that these proposals would lead in the commercial field to paralysis of efficiency, initiative, and service, and in the labor field to domination by irresponsible labor overlords who have a major interest in their own ends and only a minor interest in the good of industry or in the welfare of employees?

Points to Competition That Exists in Steel Industry

"The monopoly recommendation is based on the premise that the economic nature of the steel industry forces it to be monopolistic, that it now acts as a monopoly, and therefore that the only solution is

for the Government to regulate it. This charge of monopoly is apparently supported solely by the statement that price policies of the industry indicate that there is no competition.

"This statement as to the absence of competition in the steel industry is far from the facts in the case. Some 30 years ago, one steel corporation manufactured 60 per cent of the ingots produced. Today, despite the fact that it has grown steadily, it manufactures about 35 per cent. During this same period, new companies have been created, and companies once small have grown large. Today there are at least 10 major steel companies in the country.

"If there has been no competition in the steel industry, where did new companies find their opportunity to start and small companies to grow. If there is no competition now, how do smaller companies maintain their position?

"National Steel Corp. is a tangible proof of the existence of competition. It started 30 years ago as a small finishing plant; now it is one of the major integrated companies of the country. It grew and lives by competition. One, like myself, whose life has been lived in the midst of this competition finds it difficult to understand how theorists can come to such a conclusion.

"It is equally difficult to conceive the basis of facts and figures from which a conclusion such as the opinon on the labor question could be drawn. Speaking as one who has spent his entire working life in daily, intimate contact with this question and has seen the steady improvements in labor relationships that have taken place in that time, I can say that the statements or insinuations that the employee representation plan, as now in general use in the industry, is a failure is simply not in accordance with the facts.

"A 97 per cent vote of our employees in a recent election, and the fact that this plan is able to settle and has settled all questions between management and labor absolutely controverts the theorists' opinions. The steel industry has had experience with national unions in the past. This experience has led to a deep distrust of these unions—not only on the part of management but also on the part of thousands of workers.

"Whatever else may be said, this address, while presenting no facts, figures or reasons for the one-man opinions it expresses, shows on its face that it is the concept of its authors that the great desideratum of the country today is a Government controlled industry with both management and labor regimented under an all-powerful Government.

"A study of the results of this procedure in other lands should convince us that this is destructive of all that America stands for and is abhorrent to American ideals.

"In this statement, of course, I, too, have been expressing personal opinions, but it has the virtue of being opinion based upon actual experience with the facts of industry rather than academic theory."

Henry Disston & Sons, Inc., Philadelphia, recently presented gold service pins to 79 employees whose years of service totaled 4260 years. Pins for 60 years of service were given to 5 men, four active and one pensioned, while 47 active workers and 27 pensioners received 50-year pins.

..PERSONALS..

CLIFFORD S. STILWELL, sales manager, Warner & Swasey Co., Cleveland, sailed Feb. 26 for a two months' business trip through several European countries.

ALEXANDER C. BROWN, vice-president, Cleveland Cliffs Iron Co., Cleveland, has been elected a director of the Republic Steel Corp.

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JOHN MAY has been appointed general manager of sales of the American Steel & Wire Co., with offices in Cleveland, sales headquarters being removed to that city from Chicago. His appointment became effective March 1. Mr. May has been assistant general manager of sales at Worcester, Mass., in charge of electric wire and wire rope. He succeeds as general manager of sales D. A. MERRIMAN, who as vice-president of the company will remain active in the organization until his age of retirement on pension in September. Mr. Merriman has been connected with U. S. Steel almost since its inception, having been president of the Puget Sound Steel & Wire Co. when it was acquired by the American Steel & Wire Co. in 1902. He was chosen to receive the 1937 award of the Hardware Merchants' and Manufacturers' Association of Philadelphia as "an outstanding member of the hardware industry who has reflected great credit upon it." The presentation took place at the fifty-first annual banquet of the association on Feb. 4.

A native of Rockland, Md., Mr. May's first employment with the American Steel & Wire Co. was in 1909 in the order department of the New York sales office. He was transferred to Worcester for a short time but returned to New York the following year and after several promotions became, in 1921, manager of sales of electric wire and wire rope in the New York office. In 1931 he was transferred to Worcester and made assistant general manager of sales of electric wire and wire rope for the entire country.

D. A. MERRIMAN

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CHESTER R. PIEPER, president of the Iron Products Co., general machinist, La Crosse, Wis., has been elected president of the La Crosse Chamber of Commerce.

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PAUL J. CNARE, formerly identified with the Chevrolet gear and axle division of the General Motors Corp., has been appointed rep-

resentative in Wisconsin and Minnesota, with office in Milwaukee, by the Claude B. Schneible Co., Chicago. CHARLES C. HERMANN, formerly of Deere & Co., has been placed in charge of the Philadelphia office, which covers eastern Pennsylvania, Maryland, Delaware, and the lower New Jersey territory.

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ROBERT F. VOGT, assistant chief consulting engineer since 1921 of the Allis-Chalmers Mfg. Co., Milwaukee, has been appointed chief consulting engineer, to succeed the late J. F. Max Patitz. Mr. Vogt is a graduate of the Swiss Polytechnicum and began his professional career in the United States in 1903. Four years later he entered the employ of the Allis-Chalmers company as a mechanical engineer.

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AUSTIN EDWARDS, for many years associated with the Middletown sales district of the American

AUSTIN EDWARDS

Rolling Mill Co., Middletown, Ohio, has been named manager of the new district sales office which has been established in Indianapolis. Offices will be located in the Circle Tower.

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W. F. PERKINS, vice-president in charge of the American Hammered Piston Ring and Bartlett Hayward divisions of Koppers Co., has also been placed in complete charge of the company's Western Gas division in Fort Wayne, Ind.

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GEN. SIR HERBERT A. LAWRENCE, chairman of Vickers, Ltd., of Great Britain, has asked to be relieved of his duties as chairman, effective at the conclusion of the next annual meeting. Sir Herbert will retain his seat on the board for the time being. A. A. JAMIESON, who has been a member of the board for over eight years, will succeed Sir Herbert as chairman.

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EDWARD L. RYERSON, vice-chairman, Inland Steel Co., has been re-elected for the sixth time president of the Community Fund of Chicago, Inc.

THOMAS S. HAMMOND, president, the Whiting Corp., Harvey, Ill., has been elected a director of the Illinois Bell Telephone Co. He succeeds the late William Butterworth.

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MANLY B. BROWN has been appointed assistant manager of sales, pipe division, Republic Steel Corp., and will devote his efforts to oil

(CONTINUED ON PAGE 88)

Steel Engineers Meet at Youngstown

(CONTINUED FROM PAGE 59)

use of a much thinner section. It was claimed that the higher cost in using alloy steel parts was returned in longer and better service.

One growing use of alloy steel and furnace auxiliary construction can be found in chains which are alternately single and double links and are made flexible by the insertion of a pin which has been spot welded. This procedure allows for flexibility. In the belt type furnace, woven alloy wire has been used successfully, while another method of construction consists of solid cast alloy pieces. It has been found that cold work can be placed on the hot belt without cracking, since the small pieces used in constructing the conveyor result in the elimination of expansion and contraction troubles. Other uses of alloy steel, involving sheets for annealing covers and rails used in the rail roller type furnace, were described. Most of the discussion around these points centered on the handling of material as it starts on its journey through the heat-treating furnaces.

The speaker went into some detail on the different methods of firing modern furnaces. A description of the radiant tube furnace was given, and it was indicated that there are apparently as many in favor of horizontal tubes as there are for vertical tubes. On the vertical tube pipes there is more expanse towards the bottom of the tube owing to the need for greater heat at that point. Rounding out the complete discussion of furnace design, Mr. Mawhinney touched on the various methods of firing and heat and atmosphere control.

During a discussion of the paper, it was indicated by one member that costs have been reduced as each new development has been brought about. It was also pointed out that makers of gas-fired furnaces have improved upon their products steadily by following some of the ideas used in the electric furnace. The goal most sought after is to make heating furnaces as flexible as possible and in cases where the material cannot be moved, it becomes necessary to move the furnace. Under these conditions, much time and research have been spent in cutting down the total weight of heating units without affecting their satisfactory performance.

In presenting his paper on the rolling of hot strip steel, Mr. Giese went into quite some detail on the proper size of slabs to use and the necessary heating required in order to get the best results. He described the use of the chrome ore as against the conventional brick and steel skid hearth and indicated that the cost of using the chrome ore was negligible but that beneficial results were obtained, thus helping to cut down costs. Another interesting point brought out was the fact that a hot charge of steel will not descale as well as a cold charge and at this point considerable time was given to describing the proper size of slabs to be charged in order to get the most economical operation on the mill.

Mr. Giese touched on bad surface

resulting from rolled-in scale; tail marks caused by imprints from the work rolls, and split centers or scale drags resulting from cold steel, worn-out rolls, or overdraft.

It could easily be seen before Mr. Giese had hardly started his talk that everyone had reached the conclusion that the detailed study and caution necessary to produce a satisfactory strip steel and yet maintain production is of far greater magnitude than is commonly supposed. For instance, it was shown one must work up cautiously and gradually in making a set-up for rolling wide sizes and if the proper care is not exercised, breaking of rolls, spindles, etc., are likely to result. Over-draft and overheating accompanied by the lack of the proper amount of water, was also said to be a frequent cause of rolls breaking. The speaker described the use of acid etching to prevent the slipping of rolls on the roughing mill. The solution is composed of two parts of nitric acid and one part of water and is introduced into troughs on the stand. The roll is turned in the acid and as soon as the etch is noticed, the solution is removed and the roll is washed thoroughly to eliminate all traces of acid.

Mr. Snyder's paper on the Ward-Leonard Control for blooming mill auxiliary drives was a complete description of a set-up used by a Midwestern steel plant on one of their recent installations. Three advantages claimed by the speaker included faster operations, reduction in mill delays and lower power costs per ton of steel. The main disadvantage consisted in the fact that s e p a r a t e generators were necessary for each drive which made the initial cost higher than the usual accepted method. During a discussion of Mr. Snyder's paper, it was brought out that the use of the Ward-Leonard Control cost about $75,000 more than the ordinary method, and the pioneering efforts of the steel company in installing this method are being watched closely. Mr. Snyder indicated that the company, after operating their blooming mill for some time, are quite satisfied with the results obtained. Another member discussing the paper thought that the steel companies were selling themselves on the idea, inasmuch as they were already using it on such equipment as flying shears, screw downs, and blast furnace skip hoists. He said that many companies were going ahead with these changes quietly and he felt that the performance of the blooming mill under discussion might determine whether the described method of control would become more widely used.

New Kaiser Wilhelm Bulletins Available

THE eighteenth volume of the bulletins of the Kaiser Wilhelm Institute for Iron and Steel Research, Düsseldorf, Germany, is now completed and ready for distribution. As usual, the material covers a wide range of chemical, physical, mechanical, and metallurgical research. The following topics are included, according to a translation furnished by W. Trinks, of the Carnegie Institute of Technology:

No. 1 [19 pages].

(294) "Fatigue Strength Diagrams of Steels, With Different Average Tension Levels, and for Different Shapes of Test Bar."

(295) "Alternating-Stress Fatigue Limit of Steels as a Function of the Frequency of Stress Alternation."

No. 2 [5 pages].

(296) "A New Monochromatic Optical Pyrometer With Calibrating Lamp."

No. 3 [7 pages].

(297) "X-Ray Measurements of Stresses in Quenched Steel Shafts."

(298) "X-Ray Measurements of Stresses in Welded Wide-Flanged Beams."

No. 4 [7 pages].

(299) "Tests on Magnetic Preparation of Low-Grade Iron Ore From Lower Silesia."

No. 5 [7 pages].

(300) "On the Kinetics of the Con-

version of Austenite V (Tests With Self-Hardening Steel)."

No. 6 [13 pages].

(301) "On the Creep of Metals Subjected to Constant Tensile Stress."

No. 7 [23 pages].

(302) "Tests on Forces and Deformations in Drop-Hammer Forging."

No. 8 [20 pages].

(303) "The Reactions of Molten Iron, Nickel and Manganese With Their Liquid Silicates and Solid SiO_2 at 2900 Deg. F."

No. 9 [25 pages].

(304) "The Effect of the Formation of Silicides, Phosphides and Carbides in Molten Iron Upon Their Equilibria With Oxides."

(305) "Reaction Heats of Nickel-Silicon Alloys."

No. 10 [13 pages].

(306) "On the Reactions in the Basic Open-Hearth Furnace (With Particular Emphasis on the Oxygen Contents of Steel)."

No. 11 [14 pages].

(307) "On the Magnetic Properties of Natural and of Artificial Iron Hydroxides."

The average cost per page is 8c. For those who purchase the whole volume at one time, there is a reduction.

For those who can read German and are interested in iron and steel research, these bulletins constitute interesting and profitable reading.

This Week on the Assembly Line

(CONCLUDED FROM PAGE 63)

ery and methods that will reduce costs or improve quality. In fact, because this has been a consistent policy for years, Ford tolerances on motor parts are the closest in the industry and represent one of the outstanding features of the V-8 engines.

Within the last month or so, a radical change in Ford machinery policy has been put through at the direct instigation of Henry Ford. It seems that the tendency has been to make machinery, particularly special-purpose equipment, as large and massive as possible in order to eliminate all deflection due to tool loads as well as distortion of machine frames due to their own weight when they are shifted from one location to another. In a recent trip through the plant, Mr. Ford noticed that a very small cutter was being supported on a huge arbor mounted in massive bearings incorporated in a head several feet in diameter. The inconsistency of such design seemed so apparent that, as a result, all machinery suppliers are being asked to design their equipment from the point of view of making the components smaller in size and lighter in weight. Mr. Ford seems to be a believer in the old adage "The more cast iron the less brains." There is also a definite swing from hydraulic back to mechanical feeds.

Incidentally, Ford is dropping the construction on the small 60-hp. V-8 engine whereby stainless steel plates are welded on each side of the block to inclose the water space. Using almost 2 lb. of stainless steel at 27c. a lb. has proved to be too expensive a construction. Instead, the block is to be made in one piece in the foundry, as on the big job. In another month or two it will be in regular production. On the 85-hp. engine all the cylinder heads going into cars for Michigan distribution are now being made of cast iron instead of aluminum. There is a difference in cost of $3 per block between the two jobs. For distant assembly plants, there is an offsetting lower freight rate on aluminum heads due to their lighter weight.

...OBITUARY...

ARTHUR L. WARNER, general superintendent of the Illinois Iron & Bolt Co., Carpentersville, Ill., died at St. Petersburg, Fla., on Feb. 3.

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FRANK J. BAUMAN, sales manager of the steel tool department, Republic Steel Corp., died on Feb. 23, after a six weeks' illness, at the age of 54 years. He occupied a similar position with the Bourne-Fuller Co., Cleveland, before that company was merged with Republic.

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DAVID BALKANSKY, one of the founders of the Manitowoc Iron & Metal Co., Manitowoc Foundry Co., Wisconsin Aluminum Foundry Co., all of Manitowoc, and identified with the metal industries in that city for 35 years, died Feb. 19, aged 57 years. He was born in Russia and went to Manitowoc in 1896. Mr. Balkansky retired because of ill health last fall.

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JOHN J. LEACH, one of the founders of the Badger Meter Mfg. Co., Milwaukee, died Feb. 20, aged 74 years. He was born in Fort Wayne, Ind., and resided in Milwaukee since 1876. The meter concern was organized in 1905 and Mr. Leach was president and treasurer for many years.

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JOHN W. HARTSOOK, sales representative in the Southeastern division of E. C. Atkins & Co., Indianapolis, died of a heart attack at his home in Decatur, Ga., on Jan. 20, aged 55 years.

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GEORGE A. MATTISON, SR., president and founder of the Woodstock Slag Corp., Birmingham, died on Feb. 6, aged 78 years.

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EDWIN WINSOR REED, vice-president and general superintendent of the Reed & Prince Mfg. Co., Worcester, Mass., died at his home in that city, Feb. 13, following a long illness. He was born in Worcester 45 years ago, and had been with the company since his graduation from Worcester Polytechnic Institute in 1914.

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CHARLES C. GIBSON, president, Mullins Mfg. Corp., Salem, Ohio, died suddenly Feb. 21, aged 58 years. He began his service with the company as an office boy and later became private secretary to the president, W. H. Mullins. He succeeded Mr. Mullins as president when the latter became chairman of the board. Mr. Gibson was prominent in civic welfare activities in Salem.

WARREN HOWLAND JONES, secretary, assistant treasurer and director of the Westinghouse Electric & Mfg Co., died of pneumonia recently at his home in Mt. Vernon. He was born in Amherst, Mass., and had been with the Westinghouse Co. for 26 years. Before that time he was with the Rock Island Railroad. He was secretary of numerous affiliates of the American Westinghouse Co. and was elected a director of the parent company in 1933.

PERSONALS

(CONTINUED FROM PAGE 83)

country tubular sales. His headquarters will be in the Republic Building, Cleveland. Mr. Brown has been eastern representative of Wilson & Bennett Mfg. Co., Chicago, and previously was Chicago representative of the Ohio Corrugating Co., Niles, Ohio, and for eight years was Chicago district sales manager for the Wheeling Steel Corp. He spent two years in France during the War.

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C. W. POMEROY has been elected secretary of the Westinghouse Electric & Mfg. Co. to fill the vacancy caused by the death of Warren H. Jones. Mr. Pomeroy was born in Easthampton, Mass. He entered the employ of the Westinghouse Electric & Mfg. Co. in 1908 as a stenographer in the office of the secretary. In 1912 he became secretary to the vice-president. From 1917 to 1918 his duties took him to Washington as secretary to a member of the National War Labor Board. From 1919 to 1934 he was secretary to the president of the Westinghouse Electric International Co. In 1934 he was selected supervisor of foreign licenses, which position he has held since that time.

ALBERT OLSEN has been elected assistant secretary of the Westinghouse Electric & Mfg. Co. He was born in Brooklyn, N. Y., and joined the Westinghouse organization in 1918. He has been in the secretary's office since 1924.

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DR. FRANK CONRAD, assistant chief engineer of the Westinghouse Electric & Mfg. Co., has been awarded the Lamme medal for 1936 by the American Institute of Electrical Engineers for "Pioneering and Basic Developments in the Fields of Electric Metering and Protective Systems." Dr. Conrad, who now has 200 patents for inventions he developed, will be awarded the medal at the midsummer convention of the association which will be held in Milwaukee next June. Dr. Conrad joined the Westinghouse company as a boy of 16 in 1890. He was one of the pioneers in the radio field and built the transmitting equipment, antenna and microphone systems of the Westinghouse Radio Station KDKA used in 1920 to transmit the commercial broadcasting. He has been assistant chief engineer of Westinghouse since 1921.

Coke Output Gains; Stocks Decrease

TOTAL output of both by-product and beehive coke during January amounted to 4,629,532 net tons, or 151,027 tons per working day, an increase of 0.5 per cent over the daily rate prevailing in December of 150,283 tons. Total volume for December was 4,608,655 tons.

Production of beehive ovens showed the largest gain, the month's output of 271,900 tons, or 10,458 tons daily, contrasting with 260,600 tons in December, or 10,023 tons daily, a rise of 4.3 per cent. Total by-product coke produced came to 4,357,632 tons, against 4,348,055 tons for December. On a daily working basis this equaled 140,569 tons in January and 140,260 tons during December, an increase of 0.2 per cent.

Total production of both types of 4,629,532 tons for January compares with but 3,450,342 tons in the corresponding month a year ago, representing a gain of about 34 per cent.

Stocks at by-product plants at the close of December were 9.0 per cent less than at the beginning of the month, the bulk of the decrease occurring at merchant plants, where reserves were depleted by 10.7 per cent.

Structural Steel Bookings Decline

THE volume of fabricated structural steel booked during January showed a seasonal decrease as compared with December, according to the American Institute of Steel Construction. The total was 130,651 tons, compared with 166,542 tons in December and 120,364 tons in January, 1936. Shipments also were lower at 92,020 tons for January, against 121,775 tons for the preceding month and 79,995 tons for January, 1936.

The business booked during January represented nearly 60 per cent of average orders placed during the 1928-31 period, whereas shipments were somewhat over 39 per cent of the 1928-31 monthly average.

Carnegie-Illinois Signs Contract With CIO; $5 a Day, 40 hr. per Week

PITTSBURGH, March 2.—For the first time in the history of the steel industry, the leading producer has signed a contract with an outside union. Late tonight an agreement was made between Carnegie-Illinois Steel Corp. and the Steel Workers' Organizing Committee on behalf of its members who are employees of the corporation. This agreement provides for an increase in wages, establishment of an 8-hr. day and 40-hr. week, with time-and-a-half payment for overtime in excess of such established work day and week. The agreement further provides for a joint committee meeting between Carnegie-Illinois and the SWOC not later than March 10, 1937, for the purpose of effectuating a written agreement on working conditions, application of wage rates, hours, rules, and a method for adjudication of disputes arising under the terms of the agreement. The contract signed today will remain in force until Feb. 28, 1938. The SWOC will negotiate with all other subsidiary companies of the United States Steel Corp. within the next week or two. The 3½-hr. conference late this afternoon was conducted in an extremely cooperative manner by both parties.

The contract as signed by B. F. Fairless, president of Carnegie-Illinois, and SWOC officials, promises that there will be no interference with the right of employees to become members of the union and that there will be no discrimination or coercion by either the steel company or the SWOC. The SWOC will extend invitations to independent steel companies for negotiating conferences before the end of the week.

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The Carnegie-Illinois Steel Corp. made the following statement on Tuesday:

"As a result of numerous requests from various plants for wage increases, we announce the following schedule effective March 16, 1937. The common labor rate of 52½c. per hr. will be increased to 62½c. per hr.; all other rates will be adjusted equitably. The basic 40-hr. wage will be established and time-and-a-half time paid for more than 40 hr. per week or 8 hr. per day. The adoption of the 40-hr. basic week is made necessary in order to qualify for Government contracts under the Walsh-Healey Act."

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American Steel & Wire Co. and National Tube Co. announced today time-and-a-half for over 40 hr. a week and $5 a day minimum.

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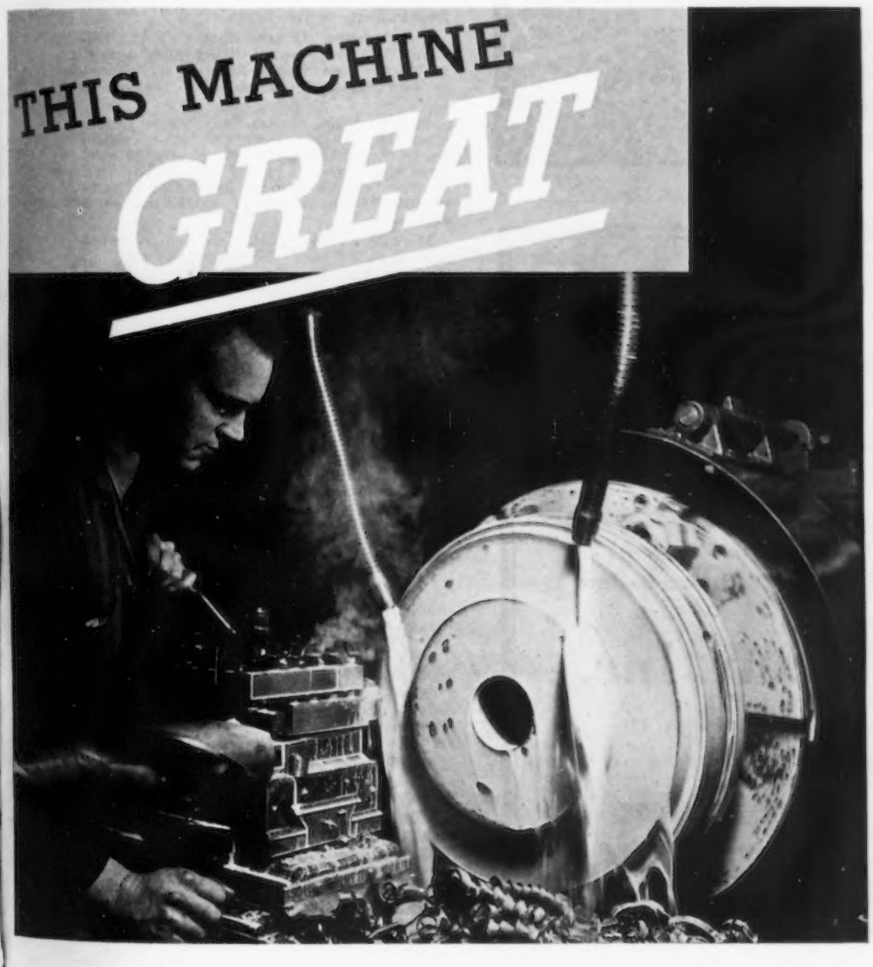
Other companies which late last night followed National Steel Corp.'s lead in raising wages were Bethlehem Steel Co. and Inland Steel Co. Jones & Laughlin Steel Corp. is still negotiating with their employee representatives and have not as yet reached a conclusion, although a wage boost is expected some time this week.

It was indicated at SWOC headquarters that requests for meetings would be made upon every other steel company. It was also said that these negotiations will in no way affect the calling of a labor convention in Pittsburgh early in April. The quick turn of events in the last few days apparently takes the strike threat out of the picture and the unprecedented action of Mr. Fairless affords an optimistic viewpoint toward the elimination of serious and costly industrial strife. During his recent tour of the Carnegie-Illinois Steel plants, Mr. Fairless, speaking on industrial strife, said:

"The history of industrial strife in the past has shown that there were few instances in which that which was gained by shutting down plants, disturbances and bloodshed, could not have been gained through peaceful methods, through discussions of mutual problems across the conference table. In most instances the reaction after it ended was, 'what was it all about?' This is the general reaction of the World War. Millions of lives were lost and billions in property, for which we all are paying now in taxes and otherwise. Most of us who look back upon the war now, ask, 'What was it all about?' And I do not speak in an unpatriotic



manner. I have no quarrel with those who have joined or contemplate joining outside organizations. That is a matter for the individual to decide. My only hope in this regard is that those who join and those with whom they associate on the outside are honest and sincere."

At the same time that Mr. Fairless was meeting with the SWOC group, on behalf of those employees in his company who are union members, meetings of the employee representatives in all plants of the Carnegie-Illinois Steel Corp. were in progress Monday afternoon. At the employee representatives meetings, management expressed the desire to talk over the wage demand and to inform each employee body that the company was holding similar conferences with all groups representing its employees.

The gaining of the $5 a day minimum and the time and a half for work over 40 hr. which has been granted by some companies and which will be granted by others before the week is out, represents an attainment of demands made by both the employee representatives' union and the SWOC lodges. This settlement will also clear up the situation with regard to Navy contracts let under the Walsh-Healey Act, which has been a bone of contention for the past several weeks.

..CAST IRON PIPE..

Winton, N. C., plans pipe lines for water system and other waterworks installation. Fund of $87,000 is being arranged through Federal aid. A. S. Mitchell, mayor, is active in project.

Buhler, Kan., plans about four miles of main water pipe from new source of service, where deep-well pumping station will be located, to town limits. Financing is being arranged.

Courtland, Ohio, plans pipe lines for water system and other waterworks installation. Financing will be carried out through Federal aid. Wight-O'Rourke Co., Guarantee Title Building, Cleveland, is consulting engineer.

Constructing Quartermaster, Sacramento Air Depot, Sacramento, Cal., closes bids March 16 for installation and completion of water system, including pipe lines and accessory equipment (Proposal 6870-17).

Anaheim, Cal., plans extensions in water pipe lines, including new lines in La Palma, Sycamore and Citron Streets. Cost about $36,800, part of fund to be arranged through Federal aid. V. W. Hannum, superintendent, Light, Water and Power Department, is in charge.

Constructing Quartermaster, Fort Benning, Ga., plans water distribution system, including pipe lines, fittings and accessories; bids to be asked soon. Cost about $180,000.

Maben, Miss., closes bids March 5 for pipe for water system and other waterworks installation, including elevated steel tank and tower. Fund of $34,500 has been secured through Federal aid. A. S. Brumby, Starkeville, Miss., is consulting engineer.

Marceline, Mo., has awarded contract for 4 and 10-in. for water system, to Central Foundry Co., Chicago, and will ask bids soon for pumping equipment and accessories. Project will be carried out by day labor. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers. Glen C. Fox is water superintendent in charge.

Milwaukee closes bids March 4 on approximately 1925 tons of class C water pipe and small quantity of special castings.

Hastings, Minn., plans pipe for water system. Fund of $35,000 is being arranged through Federal aid for this and other waterworks installation, and lines for sewer system. Ealy G. Briggs, 1955 University Avenue, St. Paul, Minn., is consulting engineer.

Salem, Ore., plans 10 and 27-in. pipe for new cross-town line for main water supply. Fund of $126,000 is being arranged. Stevens & Koon, Spalding Building, Portland, are consulting engineers. Cuyler Van Patten is manager of water department.

Glendale, Cal., plans about 9200 ft. of 6-in. for water system in Verdugo Hills district. New pumping station will be installed. J. C. Albers is city engineer.

South Gate, Cal., has awarded 385 tons of 4 to 12-in. to United States Pipe & Foundry Co.

Albuquerque, N. M., has awarded 130 tons of 4-in. to an unnamed bidder.

Los Angeles will open bids March 5 on 3524 tons of 8 and 12-in. pipe.

Oakland, Cal., East Bay Municipal Utility District will open bids March 10 on 1000 tons of 4 to 12-in. for a water system.

February Pig Iron Output 2,994,883 Gross Tons

ESTIMATED production of coke pig iron in February totaled 2,994,883 gross tons, compared with 3,211,500 tons in January. The daily rate in February, at 106,960 tons, was 3.2 per cent over the 103,597 tons in January, and was the highest since October, 1929, when production was 115,745 tons. There were 174 furnaces in blast on March 1, a gain of four over the 170 in operation on Feb. 1.

Among the furnaces blown in during the month were: One Bethlehem Steel Co. furnace; one Aliquippa unit, Jones & Laughlin Steel Corp.; one Ohio furnace, Carnegie-Illinois Steel Corp.; one Calumet, Wisconsin Steel Co.; and one Federal, Interlake Iron Co.

A Cambria stack of the Bethlehem Steel Co. was the only furnace blown out or banked.

(Complete tabulations will appear in next week's issue.)

Mesta Profits Rise; Future is Rosy

MESTA MACHINE CO. reports a net profit for 1936, after all charges including taxes, of $4,266,963, equivalent to $4.26 a share, compared to $3,114,526 or $3.11 a share in 1935. Uncompleted business at the close of 1936 amounted to $14,363,088, compared with $8,164,877 at the end of 1935. Lorenz Iverson, president, in a report to stockholders said that "Since there is no apparent change in the ratio of selling price to production cost, I can see no reason why earnings should not be satisfactory (for 1937)." According to him, capacity operations for the balance of the year are assured. He also announced that a new department now under construction, for the manufacture of forged-hardened electric steel products, is being added to the company's facilities. Other capital expenditures are being made.

Columbia Steel Lifts Pig Iron Price $2.50

COLUMBIA STEEL CO. announced today (March 2) an advance of $2.50 per ton on pig iron from its Provo, Utah, furnace, effective March 1. The new price is thus $20.50 f.o.b. for basic iron and $21 a ton, f.o.b., for the No. 2 foundry grade.

Detroit Has Two More Sitdown Strikes

MARCH 2.—Sitdown strikes continue to spread in plants serving the automotive industry. Motor Products Corp., now in process of merger with the Briggs Mfg. Co., had a sitdown on its hands this morning. At noon Murray Corporation's big body plant was completely tied up by a sitdown strike in which recognition of UAW appears to be the main point at issue. Both companies supply the Ford Motor Co., although only a fraction of the total requirements. Thompson Product's strike remains deadlocked. This latter company is a supplier to most of the automobile plants, and takes care of some General Motors units 100 per cent.

Navy to Advertise Again for Steel Bids Under Walsh-Healey Act

WASHINGTON, March 2.—Announcement of steel companies of adoption of the 8-hr. day, 40-hr. week was followed today by a Navy Department statement that it will readvertise at once for bids on March 16 for about 9000 tons of steel for six destroyers and three submarines. The new steel working schedule brings the hours into line with the provisions of the Walsh-Healey Act, which had been the stumbling block in getting steel for these vessels. The Navy Department expressed the hope that its program will now go forward without further delay.

The move of the steel companies also brought about a postponement of a meeting which was to be held this afternoon by a group of the House of Representatives, which had said it would consider legislation to build steel producing capacity sufficient to supply national defense requirements. While it has been doubted any such program actually would be adopted by Congress, the House group initiated its move as a club to force the steel industry to comply with the terms of the Walsh-Healey Act.

"We postponed the meeting but will meet again if anything goes bad in negotiations," said Representative Maverick, of Texas, a leader of the group, in referring to negotiations steel companies have taken up with representatives of the Amalgamated Association of Iron, Steel and Tin Workers, an affiliate of John L. Lewis's Committee for Industrial Organization.

Assistant Secretary of the Navy Charles Edison said that he was naturally gratified at the adoption of the 40-hr. week by some of the steel companies. He said this action should now make it possible for the Navy Department to receive acceptable bids on the Navy's requirements for this basic material.

Mr. Edison further indicated that it was his sincere hope that other concerns, doing business with the Navy, would now see their way clear to follow the lead of the steel industry. He said that some articles that the Navy, up to the present time, has been unable to obtain through bids include machine tools, hydraulic gears for ordnance equipment, diesel-driven electric generators, refrigerating and air-conditioning machines, electric outlet and feeder boxes, twine, ingot copper and steel.

Mr. Edison stressed the point that the conduct of an expeditious and efficient large scale ship building program demands a constant and uninterrupted flow of all materials in accordance with a prearranged time schedule of deliveries. Unless this is possible, it was pointed out, a "stop and go" program would develop which would greatly increase the construction time, cause labor discontent through interruption of the continuity of employment and also result in additional cost.

"It is obvious, therefore, that what has happened in steel does not solve all the problems facing the Navy," said Mr. Edison. Even the steel situation will not be definitely clarified until the results of the bidding become known."

Capacity of Steel Industry Decreased During 1936

BLAST furnace and steel-making capacity of the steel industry declined during 1936, marking the third successive decrease in the aggregate annual blast furnace capacity of the industry, and the second consecutive decrease in steel capacity, according to a report issued by the American Iron and Steel Institute.

Total annual capacity for producing steel ingots as of Dec. 31, 1936, was 69,244,694 gross tons, compared with 69,428,989 gross tons on Dec. 31, 1935. The peak of steel capacity of the industry was reached in 1934 when the capacity was 69,734,701 gross tons a year.

Blast furnace capacity declined about 265,000 tons during 1936, from 49,869,893 gross tons annually on Dec. 31, 1934, to 49,604,737 gross tons on Dec. 31 of last year. Pig iron capacity dropped 344,000 gross tons to 48,587,937 while capacity for producing ferroalloys increased 79,000 gross tons to 924,800 gross tons a year. Although the current ferroalloys capacity is the highest in history, capacity for making pig iron is 8 per cent below the 1924 peak of approximately 52,700,000 gross tons a year.

Abandonment during 1936 of bessemer converters having an aggregate capacity of 870,000 gross tons of steel per year was responsible for the decline in total steel capacity, since both open-hearth and electric furnace steel capacity increased during the year.

During the past two years more than 1,500,000 tons of annual bessemer steel capacity has been abandoned, reflecting the gradual decrease in demand for steel made by this process. In 1875 about 86 per cent of the steel ingot output was bessemer steel, while only 2 per cent was made in open hearth furnaces. During 1936, however, about 91 per cent was open hearth steel, and only 7 per cent was bessemer.

Open hearth ingot capacity was increased more than 685,000 gross tons during 1936 as eight new furnaces were built and several older ones modernized and enlarged. Electric furnace capacity showed little net change during the year, 943,252 gross tons of ingot per year as of Dec. 31, 1936, as against 942,900 at the close of 1935.

The table above shows details of annual capacities for both 1935 and 1936:

ANNUAL BLAST FURNACE CAPACITY

(Gross Tons)

As of Dec. 31	Annual Capacity — Coke: Pig Iron	Coke: Ferroalloys	Charcoal Pig Iron	Total
1936	48,587,937	924,800	92,000	49,604,737
1935	48,931,893	846,000	92,000	49,869,893

ANNUAL STEEL CAPACITY

(Gross Tons)

Ingots Only

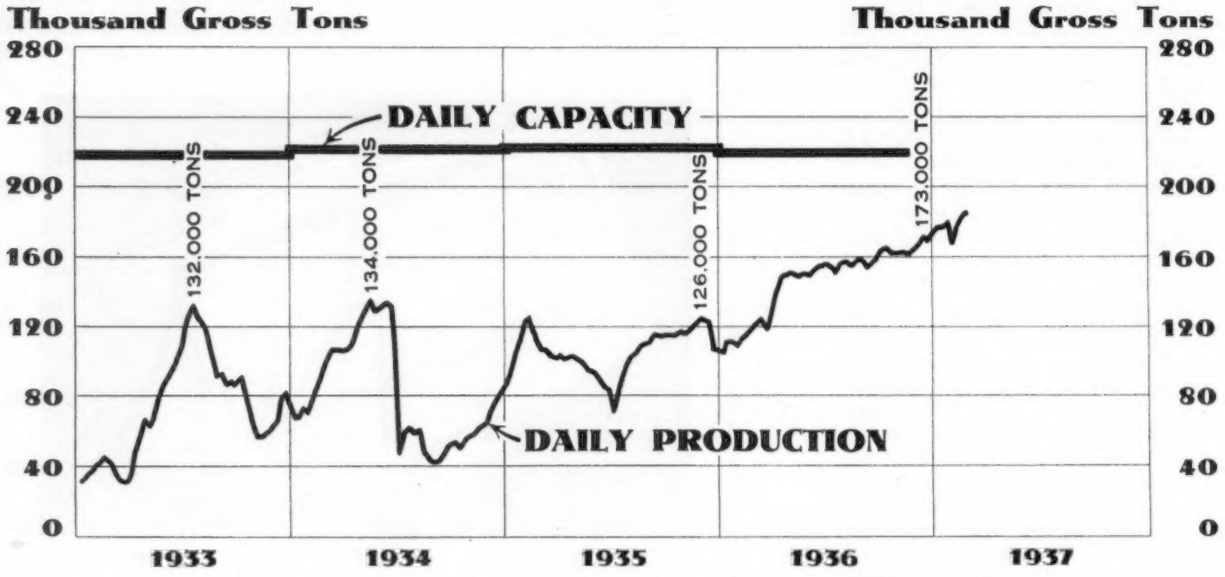
As of Dec. 31	Open-Hearth: Basic	Open-Hearth: Acid	Open-Hearth: Total	Bessemer	Crucible	Electric	Total
1936	61,045,792	920,070	61,965,862	6,325,000	10,580	943,252	69,244,694
1935	60,335,709	944,800	61,280,509	7,195,000	10,580	942,900	69,428,989
Ingots and Steel for Castings							
*1936	61,138,252	1,116,870	62,255,122	6,325,000	10,580	1,184,632	69,775,334
*1935	60,410,669	1,149,000	61,559,669	7,195,000	10,580	1,024,305	69,789,554

* Includes only that portion of the capacity of steel for castings of foundries operated by companies producing steel ingots.

STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1933-1937

Current Week	Last Week	Weeks Ended Mar. 1, 1936	Mar. 2, 1935	Mar. 3, 1934	Mar. 4, 1933
189,306	184,852	122,905	107,370	107,893	34,668



Figures for the current week are not indicated on the chart until the following week.

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week	Weeks Ended Jan. 30, 1937	Mar. 1, 1936	Mar. 2, 1935
Pittsburgh	87.0	87.0	80.0	39.0	37.0
Chicago	81.0	80.5	78.5	63.0	54.0
Valleys	85.0	83.0	76.0	60.0	53.0
Philadelphia	60.0	58.0	56.5	40.0	35.0
Cleveland	82.0	80.0	79.0	66.0	63.0
Buffalo	91.0	88.5	81.0	26.0	41.0
Wheeling	99.0	98.0	46.0	80.0	80.0
Southern	74.5	74.5	77.5	67.0	54.0
Ohio River	48.0	45.0	15.0	73.0	80.0
Western	91.5	91.5	91.5	60.0	35.0
St. Louis	80.0	82.0	75.0	77.0	37.0
Detroit	100.0	93.0	93.0	100.0	100.0
Eastern	98.0	98.0	95.0	50.0	40.0
Aggregate	85.0	83.0	75.0	55.0	48.5
Average Year to Date	80.6	80.0	78.8	51.8	50.5

Weekly Booking of Construction Steel

FROM THE IRON AGE

	Week Ended Mar. 2, 1937	Feb. 24, 1937	Feb. 2, 1937	Mar. 3, 1936	Year to Date 1937	1936
Fabricated structural steel awards	10,700	12,350	18,910	14,000	228,145	190,715
Fabricated plate awards	1,845	870	4,175	2,215	28,265	65,670
Steel sheet piling awards	2,100	2,025	4,800	0	14,655	14,045
Reinforcing bar awards	2,380	5,200	4,030	4,350	33,195	90,380
Total Lettings of Construction Steel	17,025	20,445	31,915	20,565	304,260	360,810

. . . .SUMMARY OF THE WEEK. . . .

. . . Wage increases to be followed this week by price advances.

o o o

. . . Steel strike probably forestalled; Carnegie-Illinois recognizes CIO.

o o o

. . . Operations at 85 per cent, highest since 1929, as orders gain.

WAGE increases by several of the leading steel companies will undoubtedly spread to the entire industry before the end of the week. In the Central district the common labor rate has been advanced from 52½c. to 62½c. per hr., equal to a minimum of $5 a day, and time and half has been granted for work in excess of 40 hr. a week. In districts where wage rates have been lower than in the Central area it is probable that increases will be given that will preserve the geographical wage differentials. Skilled labor whose pay is in excess of the $5 a day minimum will receive approximately 10 per cent additional. The new wage level is effective March 16.

In granting these wage increases, steel companies probably have forestalled an industry-wide strike, but even more important from this angle is the action of the Carnegie-Illinois Steel Corp. in conferring with the Steel Workers' Organizing Committee of the CIO, thereby officially recognizing the John L. Lewis union. That the steel industry is not of one mind in this matter is no secret, and some companies may not readily follow the same procedure. Recognition by the leading unit of the United States Steel Corp. will, however, give Lewis the entering wedge that he obtained in the automobile industry through a conference with General Motors. Regardless of the opposition that the CIO may encounter in dealing with other steel companies, the way is believed to have been opened for peaceful negotiations. Another important factor in the new wage situation is that it offers a solution for the Walsh-Healey Act controversy that will be acceptable to the Federal administration.

In thus finding at least the partial answer to some of its problems, the steel industry has created new problems, chiefly that of costs, though the question of an adequate supply of skilled labor on a 40-hr. week basis is not to be ignored. Labor is not the only element, however, of higher costs, as raw material price advances are almost unpredictable. Steel scrap at Pittsburgh has risen $1 a ton, or $2 within two weeks; Lake Superior ore prices probably will be 50c. a ton higher, adding $1 a ton to the cost of making pig iron; coal possibly will be higher if the United Mine Workers win their demands, and advances in nonferrous metals are steadily adding to the costs of all coated steel products.

Steel companies are working on cost sheets in an effort to determine the amounts that must be added to selling prices in order to preserve profits. The Carnegie-Illinois Steel Corp. has stated that it will announce prices on March 5. These probably will range from $3 to $8 a ton above present quotations and will cover all products except tinplate and possibly rails. Nonintegrated makers of tinplate will be the chief sufferers from the new situation, as net prices of tinplate are lower than last year owing to a recent reduction of extras on light gages, while material and labor costs are higher. Tin bars are $4 above the price of a year ago, with another advance scheduled, and labor costs will be materially higher as a result of two advances.

Pending the announcement of prices, many of the steel companies have withdrawn temporarily from the market. Except for tubular products and a few minor items, they have nothing to sell for March shipment and are not anxious to book additional business for second quarter until prices are definitely known. News of prospective increases has, however, brought a fresh influx of specifications against contracts. It is probable that the new prices will take effect immediately, and there may be further upward adjustments in the second quarter if the advances are not sufficient to meet advancing costs. On sheet mill products most mills are sold up for 15 to 20 weeks.

In the case of the pig iron increase of $1 a ton last week orders are being accepted only for March shipment, indicating that another rise may occur for second quarter orders. Notwithstanding a gain in pig iron output in February on a daily basis, there are increasing signs of a shortage of iron. Production last month was 2,994,883 gross tons, compared with 3,211,500 tons in January, but the daily rate was 3.2 per cent higher than in January—106,960 tons against 103,597 tons. There were 174 furnaces in blast on March 1, a gain of four. Many furnaces are out of blast, but

there are difficulties in the way of a further substantial increase in output, among them shortage of ore and coke and needed repairs. Even at today's high prices some inactive merchant furnaces are unable to figure an adequate profit if they were to go in blast. Jackson County silvery iron has been raised $2 a ton.

Although steel scrap has advanced $1 at Pittsburgh, the second of this amount within two weeks, there is an easier situation at Chicago and St. Louis, high prices having brought out larger supplies. At St. Louis, prices have declined 25c. a ton. Eastern ports are clogged with export scrap on cars awaiting boats, resulting in railroad embargoes on further shipments to Boston and Philadelphia until present accumulations, totaling about 2000 carloads, have been shipped. THE IRON AGE steel scrap composite has risen to $20.25, the highest since Jan. 13, 1925, when it was $20.83.

Steel ingot production is estimated at 85 per cent, a gain of two points over last week, and the highest since October, 1929.

. . . PITTSBURGH . . .

. . . Price increases, following wage advances, may run from $3 to $8 a ton.

. . . Companies withdraw from selling until price announcements are issued.

. . . New quotations may be immediately effective; steel scrap up $1.

PITTSBURGH, March 2.—The leading producer will announce prices on Friday of this week. Discussion over the amount of the advances is running at high pitch. Judging from the increased costs of raw materials, the wide diversification in sizes and grades of orders on the books and the tremendous increase in the wage bill as the result of recent announcements, it is a fair guess that price increases will be greater than were expected a few weeks ago.

Furthermore, the steel industry is in the most distinct sellers' market in years. Many steel companies withdrew from the market last week at first quarter prices on the majority of finished steel products. Some sheet producers are booked through the second quarter at prices which prevail at the time of shipment.

In some quarters there is a belief that the price advances may run from $3 to $8 a ton and possibly more, depending on the product involved. There is also a probability that the new prices will become effective upon announcement. Meanwhile, incoming specifications are ahead of shipments. Demand for semi-finished steel exceeds the supply. Sheet promises on most grades run from 17 to 20 weeks. with only a few sizes obtainable at less than 15 weeks. Tin plate specifications are heavy and operations remain at 98 per cent.

Producers are using every bit of available primary steel-making capacity. The ingot rate for the Pittsburgh district remains unchanged at 87 per cent. The Wheeling district has moved up one point to 99 per cent.

The wage increase to take effect March 16, involving a $5 a day minimum, a rise for other workers, and the granting of the demand for time and a half for over 40 hr. a week, will break the jam which has held up the awarding of Navy contracts under the Walsh-Healey act.

Raw material markets are exceptionally strong with No. 1 heavy melting moving up $1 a ton.

Pig Iron

Local producers have advanced their prices, following the announcement of price increases in other parts of the country. Some orders have been accepted at the new prices for shipment before March 31. There is still no disposition on the part of producers to solicit new business, since the market condition, especially in relation to supplies, has not changed. In fact, some integrated mills which are stil supplying iron to the merchant market, have found it necessary to watch their sales closely in view of their own heavy requirements. Despite the fact that there is a shortage of pig iron, some customers continue a hand-to-mouth buying practice.

Semi-Finished Steel

The leading interest will announce prices on semi-finished steel late this week. An advance of possibly $3 or more a ton on some items is expected. Specifications continue to flow in freely, with demand still ahead of actual supplies. Movement of sheet bars is the heaviest in years in view of the tight situation in the sheet market.

Bolts, Nuts and Rivets

A further increase in specifications has materialized with the improvement emanating from automobile and miscellaneous sources. Releases from the former are large and it is expected that this trend will continue into the summer. A better volume of orders has come from railroad car builders and is only the forerunner of tonnages yet to be placed. Meanwhile, higher prices are expected and small rivets have already been marked up approximatey 5 per cent.

Bars

With prices to be announced the latter part of this week, consumers are looking for an advance of possibly $4 or more a ton. Considerable confusion exists concerning prices, since it has been the usual custom to announce quotations at least a full month previous to the beginning of the quarter. As there is a distinct possibility of prices becoming effective upon announcement, producers are not outdoing themselves to solicit new business.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Mar. 2, 1937	Feb. 24, 1937	Feb. 2, 1937	Mar. 3, 1936
Rails, heavy, at mill	$39.00	$39.00	$39.00	$36.37½
Light rails, Pittsburgh	38.00	38.00	38.00	35.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	29.00
Sheet bars, Pittsburgh	34.00	34.00	34.00	30.00
Slabs, Pittsburgh	34.00	34.00	34.00	29.00
Forging billets, Pittsburgh	40.00	40.00	40.00	35.00
Wire rods, Nos. 4 and 5, P'gh	43.00	43.00	43.00	40.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.20	2.20	2.20	1.85
Bars, Chicago	2.25	2.25	2.25	1.90
Bars, Cleveland	2.25	2.25	2.25	1.90
Bars, New York	2.55	2.55	2.55	2.20
Plates, Pittsburgh	2.05	2.05	2.05	1.80
Plates, Chicago	2.10	2.10	2.10	1.85
Plates, New York	2.33	2.33	2.33	2.09
Structural shapes, Pittsburgh	2.05	2.05	2.05	1.80
Structural shapes, Chicago	2.10	2.10	2.10	1.85
Structural shapes, New York	2.3025	2.3025	2.3025	2.06¼
Cold-finished bars, P'gh	2.55	2.55	2.55	2.10
Hot-rolled strips, Pittsburgh	2.15	2.15	2.15	1.85
Cold-rolled strips, Pittsburgh	2.85	2.85	2.85	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.80	2.80	2.80	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.90	2.90	2.90	2.50
Sheets, galv., No. 24, P'gh	3.40	3.40	3.40	3.10
Sheets, galv., No. 24, Gary	3.50	3.50	3.50	3.20
Hot-rolled sheets, No. 10, Pittsburgh	2.15	2.15	2.15	1.85
Hot-rolled sheets, No. 10, Gary	2.25	2.25	2.25	1.95
Cold-rolled sheets, No. 20, Pittsburgh	3.25	3.25	3.25	2.95
Cold-rolled sheets, No. 20, Gary	3.35	3.35	3.35	3.05
Wire nails, Pittsburgh	2.50	2.50	2.25	2.10
Wire nails, Chicago dist. mill	2.55	2.55	2.30	2.15
Plain wire, Pittsburgh	2.60	2.60	2.60	2.30
Pain wire, Chicago dist. mill	2.65	2.65	2.65	2.35
Barbed wire, galv., P'gh	3.05	3.05	2.75	2.50
Barbed wire, galv., Chicago dist. mill	3.10	3.10	2.80	2.55
Tin plate, 100 lb. box, P'gh*	$4.85	$4.85	$4.85	$5.25

*Practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Pig Iron

Per Gross Ton:	Mar. 2, 1937	Feb. 24, 1937	Feb. 2, 1937	Mar. 3, 1936
No. 2 fdy., Philadelphia	$23.76	$23.76	$22.76	$21.3132
No. 2, Valley furnace	22.00	22.00	21.00	19.50
No. 2, Southern Cin'ti	21.69	21.69	20.69	20.2007
No. 2, Birmingham†	18.38	18.38	17.38	15.50
No. 2, foundry, Chicago*	22.00	22.00	21.00	19.50
Basic, del'd eastern Pa.	23.26	23.26	22.26	20.8132
Basic, Valley furnace	21.50	21.50	20.50	19.00
Malleable, Chicago*	22.00	22.00	21.00	19.50
Malleable, Valley	22.00	22.00	21.00	19.50
L. S. charcoal, Chicago	27.54	27.54	26.54	25.2528
Ferromanganese, seab'd carlots	80.00	80.00	80.00	75.00

†This quotation is subject to a deduction of 38c. a ton for prosphorus content of 70 per cent or higher.
*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	**$21.75**	$20.75	$19.25	$15.75
Heavy melting Steel, Phila.	18.75	18.75	18.50	13.75
Heavy melting steel, Ch'go	20.25	20.25	19.00	14.75
Carwheels, Chicago	19.50	19.50	18.50	14.00
Carwheels, Philadelphia	18.50	18.50	18.50	14.75
No. 1 cast, Pittsburgh	**18.75**	17.75	17.75	14.25
No. 1 cast, Philadelphia	19.25	19.25	19.25	14.25
No. 1 cast, Ch'go (net ton)	17.00	17.00	16.00	13.50
No. 1 RR. wrot., Phila.	18.75	18.75	17.25	13.25
No. 1 RR. wrot., Ch'go (net)	18.50	18.50	16.75	13.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$4.25	$4.25	$4.00	$3.65
Foundry coke, prompt	4.50	4.50	4.50	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	15.00	15.00	13.00	9.25
Lake copper, New York	15.12½	15.12½	13.12½	9.37½
Tin (Straits), New York	54.75	54.75	50.50	48.00
Zinc, East St. Louis	6.80	6.80	6.00	4.90
Zinc, New York	7.15	7.15	6.35	5.27½
Lead, St. Louis	**6.85**	6.35	5.85	4.45
Lead, New York	**7.00**	6.50	6.00	4.60
Antimony (Asiatic), N. Y.	**16.50**	16.00	14.25	13.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
March 2, 1937	2.330c. a Lb.	$21.25 a Gross Ton	$20.25 a Gross Ton
One week ago	2.330c.	21.25	19.92
One month ago	2.330c.	20.25	18.92
One year ago	2.109c.	18.84	14.75

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1937	2.330c., Dec. 28	2.084c., Mar. 10	$21.25, Feb. 24	$20.25, Feb. 16	$20.25, Mar. 2	$17.92, Jan. 4
1936	2.130c., Oct. 1	2.124c., Jan. 8	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.199c., April 24	2.008c., Jan. 2	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, April 23
1934	2.015c., Oct. 3	1.867c., April 18	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.977c., Oct. 4	1.926c., Feb. 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	2.037c., Jan. 13	1.945c., Dec. 29	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.273c., Jan. 7	2.018c., Dec. 9	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.317c., April 2	2.273c., Oct. 29	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.286c., Dec. 11	2.217c., July 17	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.402c., Jan. 4	2.212c., Nov. 1	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927			19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Those orders which are being taken are scrutinized closely in order to conform with rolling schedules set up for the remainder of this quarter. Incoming business is equivalent to shipments with a well diversified demand. Although having taken heavy tonnages in the past, farm implement and tractor manufacturers continue to send in specifications in good volume.

Cold-Finished Bars

Higher prices on cold-finished bars will depend upon the formal hot-rolled bar announcement. Meanwhile, specifications are in good volume with unfilled tonnage averaging six to eight weeks. From present indications, the automobile industry will be in full swing by June or July, during which time producers will be taxed to supply cold-finished bar requirements. Releases from this source are increasing weekly. As soon as the price advance is assimilated, it is expected that a sharp increase in specifications will occur.

Reinforcing Bars

Although individual projects are not numerous, heavy releases from jobbers are keeping mills exceptionally busy. Deliveries are poor and in some cases producers with large hot-rolled bar backlogs are showing little interest in concrete bar business. Running through the entire situation is a shortage of steel due to lack of primary steelmaking facilities and a voluminous demand.

Steel Sheet Piling

The majority of awards in the past week involve less than 75 tons. A fair number of jobs are in the blueprint stage and are expected to materialize into firm contracts as soon as the way opens up. Carnegie-Illinois Steel Corp. has been awarded the contract for 2100 tons of piling for a lock and dam at Tuscaloosa, Ala.

Plates and Shapes

Announcements reflecting higher quotations will be made by the leading producer Friday of this week. Advances may be as high as $4 or more a ton. Unfilled tonnage on heavy plates and shapes has shown no change in the past week and promises on some sized plates are running as long as eight to ten weeks. The American Bridge Co. has booked three jobs totaling 2500 tons, 1000 of which will go into construction of a bridge at Manchester, N. H. The other two projects involve a National Guard armory and transmission towers.

Railroad Business

Grand Trunk Western has awarded 100 70-ton gondola cars to the Magor Car Corp. This railroad has yet to place orders for 400 more cars. Opinion earlier this year in some quarters leaned toward a drying up of railroad car building after the initial flood of orders were completed. Unexpected pick-up in traffic, however, has caused some observers to look for additional car-building programs before the end of the year.

Strip

Although higher prices are expected this week, most customers are paying more attention to delivery. Backlogs are still no better than five weeks and a well diversified increase in specifications has occurred within the past week. Producers are keeping their books in such shape that the minimum amount of tonnage will slip over into the second quarter and to all intents and purposes some producers are out of the market at first quarter prices. An exceptionally heavy demand is coming from the jobbing trade.

Tubular Products

It is the opinion in most quarters that a price announcement affecting all tubular products and showing substantial increases will be made in the near future. Meanwhile, specifications have increased sharply in the past week. Part of this improvement is attributable to anticipation of higher prices. There is a heavy movement of standard pipe to jobbers' warehouses, but on the other hand consumption for this item is showing improvement week by week. Boiler tube demand is strong and oil-country goods specifications continue to flow in freely.

Wire Products

Releases against contracts are exceptionally heavy and production is at virtual capacity with pressure being exerted on all sides for better delivery. With the future outlook in regard to raw material and labor costs uncertain, producers are showing no disposition to load up their books at the prices announced last week. These changes are regarded in the trade as more of a revision than a price increase. The wire size extras announced last week are $2 a ton on sizes over 6 gage to and including ¼ in., while diameters over ¼ in. take $4 a ton extra. There is a possibility of further wire advances during the second quarter.

Sheets

The sheet market is in a highly excited condition as consumers await price increase announcements due this week. Opinion in some quarters indicates an advance of from $4 to $6 or more a ton, depending on the grade, but no official information has been forthcoming. Meanwhile, delivery promises on most grades are from 17 to 20 weeks, with only a few sizes obtainable at less than 15 weeks. Some producers are practically sold out for second quarter delivery at prices in existence at time of shipment. There is a distinct possibility that many producers will be entirely out of the market at second quarter prices before the beginning of the second quarter. The trade will probably then be treated to a situation where consumers will place orders for third quarter delivery, to take the price in effect at that time. In other words, demand for sheets is so heavy that price has become a secondary factor. While it is true that some of this tonnage must be forward buying, deliveries have become so far extended that customers must anticipate in order to keep up their own production schedules. With the automobile demand coinciding with seasonal spring requirements, railroad building programs, and orders for rehabilitation purposes, sheet producers' worries have only begun.

Tin Plate

Specifications continue to roll in and operations remain at 98 per cent. A considerable amount of tin plate is being ordered for quart oil cans as the season approaches for a changeover from winter to spring oil. General line can business is in good volume and packers' specifications are adding to mill backlogs. There is no evidence of a cessation of this high rate of activity for some time to come.

Coal and Coke

Beehive furnace coke is no more plentiful than it was several months ago when customers were having a hard time picking up supplies. Several large furnace contracts have been renewed for the second quarter within the past week. Coal production continues to increase to far above normal proportions and, with negotiators deadlocked in New York, those directly and indirectly involved in the situation do not look for a settlement much before the deadline on April 1.

Warehouse Business

Warehouse business has been increasing by leaps and bounds and much of the improvement is due to the inability of customers to obtain shipments from steel mills. Local sheet warehouses have marked up prices $5 a ton, effective March 1. Advances on other items are expected as soon as mills announce their new prices.

. . . . CHICAGO . . . .

. . . Prices become center of attention as wage advances are announced.

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. . . Demand for steel unabated; operations rise to 81 per cent of capacity.

o o o

. . . Delivery situation grows worse; some sheet mills booked to June.

CHICAGO, March 2.—Following the action of Inland Steel Co. in raising hourly mill wages from 52½c. to 62½c. with time and a half for overtime in excess of 40 hr. per week and the announcement that Carnegie-Illinois Steel Corp. was conferring with employee representatives on the matter of both hours and wages, prices became the center of attention. Higher wages for steel mill workers are generally conceded to be the forerunner of higher quotations when second quarter books are opened March 5.

Demand for steel continues unabated in the Chicago area and, with the leading producer running at 72 per cent, a gain of one point over the preceding week, operations for the district as a whole approximate 81 per cent of its capacity.

Sheet mills are reported to be sold up to June and few products, if any, can be delivered before the end of the current quarter. Steel company officials in the local territory are insistent in their belief that speculative buying has not been excessive in recent weeks, but the certainty that prices are to be again advanced is expected in some quarters to result in further complication of the situation. Whether the rush to get on books will approximate the scramble of last December remains to be demonstrated, but that there will be a gain in volume appears at this writing to be a reasonable assumption.

In any event, consumers are given little hope for improvement in the delivery situation for some time to come. Plate specifications on car builders' materials continue to come in undiminished volume, more than taking the place of old structural business, which is about cleaned up.

Pig Iron

New business is limited by the fact that merchant sellers are committed for their output for the remainder of the quarter and, in the case of the leading producer, well into April. Foundry activities are well maintained at recent peak levels and another gain in shipments for the current month is not unlikely. Furnace stocks are not in much better shape, if any, than they were a week or 10 days ago.

Reinforcing Bars

Activity in this item is at relatively low ebb, but new interest is expected to pick up shortly. In line with the usual seasonal expansion in building activities. A considerable tonnage of bars will be used in the new incinerator works for the Chicago Sanitary District to be constructed at Stickney, Ill. Bids will be asked March 11 on 1800 tons of material for this project. Warehouses are understood to be well stocked against spring demand, so that additional buying from this source is not likely to jump sharply during the coming weeks.

Plates

Although miscellaneous users are more active than they have been for some time, bookings and shipments on railroad car orders constitute the chief feature of the situation and ordering against existing contracts shows no signs of slowing down over nearby weeks. The fact that much of this business was taken at the shipper's convenience is the redeeming feature of the situation so far as deliveries are concerned. Requirements of tank and structural fabricators appear to be gaining from week to week and will soon add substantially to the complicated delivery situation.

Cast Iron Pipe

Inquiries are reported to be showing a moderate increase and the trend is expected to be upward as seasonal influences exert themselves. New projects thus far have been relatively small. Prices are steady on all sizes.

Rails

Operations in this area have been stepped up to about 90 per cent of the capacity of mills to turn out the type of rails now being rolled. It is estimated that about 90 per cent of rails are now treated in some manner. On a basis of capacity for ordinary rails, current operations would be the equivalent of about 70 per cent. No new rail business has been reported in the past week.

Structural Material

Recent inquiries include 1825 tons for Texas highway bridges, 1500 tons for a bridge at Dearborn, Mich., 1238 tons for Tennessee highway bridges, 600 tons for similar projects in Colorado and 600 tons for a highway bridge at Clinton, Iowa. Small inquiries number about 40 and aggregate 7000 tons. Awards during the past week totaled only about 3500 tons, with all jobs under 500 tons.

Wire Products

Mill backlogs on most wire products continue to grow, despite the fact that operations are being maintained at recent levels between 80 and 85 per cent. Business from areas recently under flood waters is coming in good volume, with jobbers pressing for delivery of orders. Delivery promises on most sizes, particularly coarser wire, range from three to four weeks, with little likelihood that business in the next three or four weeks will permit any substantial inroads into backlogs.

Reinforcing Bars

The State of Illinois is now taking bids and issuing new inquiries for road and bridge work. This promises to be the opening gun of a spring and summer program which will add materially to fabricators' books. On the whole, large inquiries, though in the making,

are still scarce, but new small projects are more numerous. Shop backlogs are still comfortable, though most extra crews have been taken off and spring activity must move up fast if extra men are to be needed again. Prices for reinforcing bars remain badly mixed, and the few indications of promised strength shown in the first half of March have disappeared. Higher mill prices will no doubt bring higher dealer quotations, but they will have no material effect upon the keenness of competition for attractive tonnages.

Warehousing Business

Advances in sheet prices, announced within the past few days, drove in much new business and February bookings have moved ahead of those in January. March, usually one of two big months of the year, will make an excellent start. So far 1937 is well ahead of 1936. Sheets are in the lead in warehouse demand and bars are running a close second. All eyes are now on the mills, which will soon announce second quarter prices. Most of the water-soaked stocks at Cincinnati have been reconditioned and warehouse business in that area is close to normal.

Sheets

Specifications from virtually all sources are increasing steadily, adding almost daily to an already highly complicated situation. At the rate at which pressure is being brought to bear by most consuming industries, little or no relief is in sight up to mid-year.

. . . 38 out of 43 open-hearth furnaces now operating.

o o o

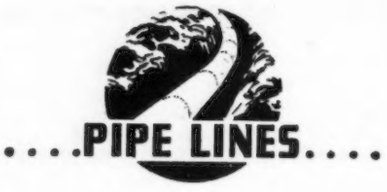
. . . Heavy shipments of pig iron continue

BUFFALO, March 2. — Bethlehem's Lackawanna plant placed another open-hearth furnace in production, bringing the Lackawanna operation to 29 open hearths. Republic Steel Corp. is operating seven furnaces and Wickwire Spencer Steel Co., two, or a total of 38 out of 43 in the district.

Placing of sizable fabricated structural and reinforcing jobs has been lighter, though a heavy volume of small jobs is going through. Bids on the Ovid, N. Y., 250-ton school structural job have been postponed till March 4. A city market building at Syracuse will require 300 tons of reinforcing bars and the Rochester incinerator job, 100 tons of bars.

The heavy schedule of pig iron shipments which has characterized blast furnace operation over the past several weeks continues.

Steel warehouse business has been good. A few price changes have been made.



New Haven Gas Co., New Haven, Conn., is arranging fund of about $100,000 for extensions and improvements in distributing system, including steel pipe lines, high-pressure cast iron mains, service facilities, meters and accessory equipment.

Hope Natural Gas Co., 545 William Penn Way, Pittsburgh, has begun surveys for new welded steel pipe line from point on Ohio River near Bellaire, Ohio, to Cleveland, over 150 miles, for gasoline transmission. Work on pipe line is scheduled to begin early in spring. Company has recently completed installation of pipe line from gasoline station at Hastings, W. Va., to Bellaire district.

Aksarben Natural Gas Co., Cambridge, Neb., plans welded steel pipe line for natural gas transmission to Cambridge, where distributing system will be installed.

Cities Service Oil Co., Bartlesville, Okla., subsidiary of Cities Service Co., New York, plans 12-in. welded steel pipe line from gas field in Pontotoc County, Okla., to connection with main 16-in. welded pipe line of company in Seminole County, Okla., about 55 miles, for natural gas transmission. Company has arranged for supply of residual gas from natural gas plant of Carter Oil Co., in first noted territory, on basis of about 15,000,000 cu. ft. per day. Booster stations will be constructed along route of new pipe line. Cost over $400,000.

Southern California Water Co., 1206 Maple Avenue, Los Angeles, plans 12-in. welded steel pipe line for main water line over Mojave River, near Barstow, Cal. Company will make extensions in cast iron distribution mains at Barstow, including new lines on Crooks and Pearce Avenues, and other streets. John Benson is local manager at Barstow.

Bureau of Reclamation, Custom House, Denver, closes bids March 10 for steel pipe, with fittings, valves and accessories for by-pass drain and air-inlet piping for paradox and ring-follower gates at Grand Coulee Dam, Columbia Basin Project, Wash. (Specifications 886-D).

White Eagle Oil Corp., Wichita, Kan., a division of Socony-Vacuum Oil Co., Inc., 26 Broadway, New York, plans 10-in. welded steel pipe line from point near Valley, Center, Kan., to Holloway, Harvey County, Kan., about 43 miles, for crude oil transmission. Connection will be made with an existing pipe line of company at last noted point. New line will form a loop between districts mentioned, providing about 60,000 bbl. additional capacity per day. Pumping stations for booster service will be located at points along route. Cost over $250,000.

. . . Southern producers raise wire and pig iron prices.

o o o

. . . Pig iron production to be further increased.

BIRMINGHAM, March 2.—Prices were raised last week on pig iron, wire and wire products. Pig iron was increased $1 a ton and the new base is $18. Increases by local mills on wire and wire products ranged from $3 to $6 a ton. Nails and staples went up $5; barbed wire, $6; woven wire fence, $4; and bale ties, $3.

Pig iron production is due to be further increased this week. Sloss-Sheffield is planning to blow in its No. 4 furnace at North Birmingham this week. This will place the company on a full pig iron production basis, as its other three furnaces are already in operation. The district's total will be increased to 16.

Last week 17 open hearths were in production and the same number is scheduled this week.

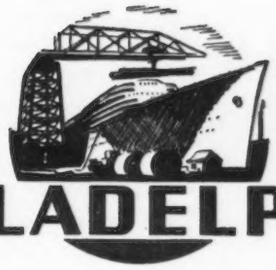
There is a fair run of new business in both pig iron and steel. Shipments are moving out steadily and mills cannot keep up with specifications against backlogs.

The cast iron pipe outlook for March is said to indicate better business than in February. The Pacific Coast is the most active section just now. Settlement of the maritime strike has released considerable tonnage and plans are being made for new lettings, which had also been delayed.

Gulf States Steel Co. will hold its annual stockholders' meeting on March 29, at which time the agreement for consolidation with Republic Steel may be presented for ratification.

Unit Stove & Furnace Co., on March 1, paid out a bonus of about $6000 to its 200 employees. The plant of the Birmingham Stove & Range Co. is still closed by a strike. The Birmingham plant of the Continental Gin Co. is also having a strike.

Negotiations between the Tennessee Coal, Iron & Railroad Co. and its red ore mine employees continue periodically, but a settlement has not yet been reached.



. . PHILADELPHIA . .

. . . Local mills expected to announce increase in wages and reduction in hours this week.

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. . . Sales offices are flooded with new business and nearly all have withdrawn from the market for the remainder of the quarter.

o o o

. . . Operations are now at 60 per cent of capacity.

PHILADELPHIA, March 2. — Overnight announcements from the largest steel producers of the establishment of a $5-a-day minimum wage for common labor and time-and-one-half for over 40 hr. a week, seem to have taken district mills by surprise, and up to this date little action has been taken on the matter, although it is a certainty that something will be done for labor. The base labor rate in eastern Pennsylvania mills is considerably lower than that which existed in the West prior to this latest advance, amounting to about 45½c. per hr., as compared with a 52½c. hourly rate in Pittsburgh and Chicago. It is believed that an 8c. or 10c.-per-hr. increase will be made in the Philadelphia district rate to maintain the differential which exists between here and the West. Local mills are expected to follow suit in the establishment of a shorter working week. Definite decisions may be made before the end of the week.

A sudden increase in the volume of new business seems to have taken place more because buyers feel it necessary to obtain a place on mill schedules than because of the impending price advance. Sales offices have been flooded with orders and nearly all mills have withdrawn from the market for the remainder of the first quarter in most products. This buying spurt in the closing days of February was sufficient to raise that month's bookings in some offices almost to December's high mark, and sellers believe the present month may even exceed that record if specifications are maintained at present rates.

Although nearly all mills are accepting business only on the basis of second quarter prices, whatever they may be, both buyers and sellers are becoming dissatisfied with the uncertainty of the situation and are eagerly awaiting price announcements so that contracts may be placed upon a more definite basis. Estimates of the increase have ranged from $3 per ton on plates and shapes to as much as $8 and $10 per ton on some grades of sheets.

Some salesmen are calling customers and warning them of the advance in prices but, by and large, steel men are content to let buyers do their own thinking, so as to avoid a repetition of the buying for coverage in December, which was in such large volume that some mills are just now beginning to benefit from the increase. In nearly all companies, however, if regular customers ask for coverage, this privilege is being granted wherever possible.

The average operating rate for local mills has advanced 2 points to 60 per cent of capacity. Finishing capacity in this area is even now hard put to take care of raw steel output, and it is thus unlikely that many new open hearths will be added in the near future.

Plates and Sheets

Plate backlogs are steadily being extended and now represent from three to eight weeks' work, while sheets are available in from five weeks to more than three months. Flat-rolled products are receiving a big share of the buying movement now under way, and from all indications most of the material is going into consumption immediately. In speculating as to the extent of the coming price advances, everyone seems to agree that these two products will be included, and that sheets are due for a stiff mark-up, perhaps as much as $8 or $10 per ton on some grades. A relatively inconsiderable tonnage of plates has been booked on a speculative basis, while sheet users are anxious to get their requirements on the books for as early rolling as possible, regardless of what price they may have to pay. Sun Shipbuilding Co. recently contracted for the construction of tankers for Sun Oil Co. and Atlantic Refining Co., each to require around 5000 tons of shapes and plates. Only two vessels, instead of three, will be built for the Philadelphia & Norfolk Line. Pusey & Jones were low bidders on this job.

Pig Iron

Following last week's increase of $1 per ton, which brought out a fair amount of buying, the market has quieted down considerably and little demand is forthcoming from domestic consumers. Foreign inquiries are still prominent, but at the moment it is understood that little attention is being given to such business. A shortage of iron has already developed, and it is not hard to imagine a much more serious situation in the near future, since rising labor and ore costs are making production in some cases unprofitable, and demand for iron from the mills is greater than for sale elsewhere. More price increases are being forecast, and few would be surprised to see another advance before the beginning of the second quarter. Shipments are holding up well, and regular customers are so well covered that heavy buying may not be experienced for another month yet.

Shapes and Bars

Structural awards this week are light, and little important work is pending. Richard de Cou, a fabricator who went out of business several years ago, has become active once more and has received 100 tons of shapes for a Harrisburg hospital. Bids are being taken this week on 1500 tons of shapes for additions to the Norfolk Navy Yard, and 400 tons for highway work in Westmoreland-Armstrong counties, Pa. There is little activity in reinforcing bars, pending the award of a fair tonnage for two Philadelphia schools. The condition of the price structure is unknown, as existing work has not been sufficient to afford a test of the market.

Imports

The following iron and steel imports were received here during the past week: 4 tons of manganese

ore from Germany; 6396 tons of chrome ore from Cuba; 50 tons of pig iron and 10 tons of drill steel from Norway; 5 tons of steel forgings from Sweden; 18 tons of steel sheets, 9 tons of diamond plates, 31 tons of steel bands, 100 tons of steel bars and 332 tons of structural shapes from Belgium; 69 tons of steel bands, 71 tons of steel bars and 28 tons of structural shapes from France.

....ST. LOUIS....

...Pig iron advance caught buyers unawares.

o o o

...Shipments heavy; melt at a high rate.

ST. LOUIS, March 2.—The advance of $1 a ton in the price of pig iron to $22.50, delivered St. Louis, came as a surprise to most users in the district. The advance became effective immediately and will remain in effect until March 31. There was some buying of spot iron during the preceding week by melters who had sensed an advance, but even they seemingly did not realize the advance would come so soon and be effective immediately, else the buying would have been heavier. Since the advance there has been no buying of consequence. Shipments of pig iron in February were reported to be about the same as during January, although the past month was shorter. The melt in the district continues at a high rate.

Further advances in finished steel, notably sheets, have been expected by buyers and sellers. But the question of deliveries halts anticipatory business. This is especially true of sheets, of which the mills have a backlog into June. Structural fabricators and sellers of reinforcing bars are complaining of lack of new business, a situation principally due to the small amount of State and Federal projects coming out. Structural fabricators in the district are operating, it is estimated, at about 50 per cent of capacity, with enough business booked to continue at that rate for the next two months. However, the demand for plates, shapes and bars is heavy because of the requirements for car building, machinery makers, etc.

RAILROAD BUYING

Pickands, Mather & Co., have ordered one 0-6-0 type superheated switching locomotive from American Locomotive Co.

Canadian Pacific has ordered 20 F-1-a type locomotives from Canadian Locomotive Co.

Grand Trunk Western has ordered 100 70-ton gondola cars from Magor Car Corp. and has 400 yet to place.

Michigan Limestone & Chemical Co. has divided an order for 30 air-dump cars equally between Austin-Western Road Machinery Co. and Differential Steel Car Co.

New York, New Haven & Hartford has placed an order for 50 passenger coaches and five cafeteria cars with Pullman-Standard Car Mfg. Co.

Norfolk & Western has ordered 2000 hopper cars, duplicating an order placed some weeks ago. The new order was divided equally between Bethlehem Steel Co. and Virginia Bridge Co. About 30,000 tons of steel will be required.

New York, Chicago & St. Louis has been authorized to issue $2,330,000 in equipment trust certificates to aid in purchase of 500 50-ton box cars, 500 50-ton gondola cars, 100 50-ton automobile box cars, 75 50-ton hopper cars and 25 70-ton hopper cars. This equipment has all been placed.

J. G. Brill Co. has received following orders for single motor 40-passenger Brill trackless trolleys: 21 from Cincinnati, Newport & Covington Street Railways, Covington, Ky., and 17 from Chicago Surface Lines, Chicago.

REINFORCING STEEL

...Awards of 2380 tons —4140 tons in new projects.

AWARDS

New York, 250 tons, Department of Sanitation garage, to Joseph T. Ryerson & Son, Inc.

Kearny, N. J., 1000 tons, Coca-Cola building, to Joseph T. Ryerson & Son, Inc., reported erroneously last week to Bethlehem Steel Co.

Chicago, 1400 tons, Sanitary District work, to Concrete Steel Co.

Chicago, 125 tons, Chicago Flexible Shaft Co., to Concrete Engineering Co.

Denver, 313 tons, All-American Canal project, to Colorado Fuel & Iron Co.

Denver, 176 tons, underpass and approaches, to an unnamed bidder.

Helena, Mont., 116 tons, bridge, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Syracuse, N. Y., 300 tons, city market building.

Rochester, N. Y., 100 tons, city incinerator.

Stickney, Ill., 1800 tons, incinerator for Chicago Sanitary District; bids March 11.

Rock Island County, Ill., 240 tons, bridge.

Moline, Ill., 180 tons, highway bridge.

Phoenix, Ariz., 927 tons, three invitations on Salt River reclamation project; bids opened.

Fort Sumner, N. M., 338 tons, Parker Dam project; bids opened.

Sacramento, Cal., 250 tons, Air Corps engineering shop and repair dock at Sacramento airport; MacDonald & Kahn Co., Ltd., general contractor.

...CINCINNATI...

...Sheet users ordering for second quarter.

o o o

...Pig iron advance stimulates buying.

CINCINNATI, March 2.—Virtually all sheet consumers in this market are placing second quarter orders, despite the fact that prices have not been announced. Current business at a rate in excess of capacity is being placed at prices to be prevailing in second quarter. Automobile users, in the market for current needs at heavy rate, are also ordering for shipment as far ahead as May. All units of American Rolling Mill Co. are now in full operation, but other district mills have not fully recovered from the flood. Northern Kentucky producers are speeding rehabilitation, with announcement of operations expected within a week. Some departments of the Portsmouth unit of Wheeling Steel Corp. are running, but full operation may not be attained for several days.

Steel ingot production is at the same rate as last week. Thirteen out of 34 open hearths are in operation.

Pig iron prices were advanced $1, last week, to take effect immediately. New quotations for delivery in Cincinnati on No. 2 foundry are $22.07 for Northern and $21.69 for Southern. New business has not reached large proportions, but melters are buying at a better rate to anticipate any further price advance. Specifications on contracts are good, but shipments are being delayed because of lack of sufficient iron to apply. The melt is slowly expanding as foundries complete rehabilitation programs.

. . . . NEW YORK. . . .

. . . Some steel companies temporarily out of market pending price increases.

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. . . Mills may not protect identified building jobs or railroad equipment.

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. . . Export demand is large and insistent; pig iron shortage looms.

NEW YORK, March 2.—Many of the steel companies have temporarily withdrawn from active solicitation of business pending the clarification of the labor and price situation. The announcement of wage increases will be followed later in the week by the naming of second quarter prices, which will be sharply upward on virtually all products except tin plate, on which no change is expected. With the exception of tubular products and possibly some minor specialties, the steel mills have no tonnage for sale for shipment this month and they do not desire to make further sales for second quarter until prices are announced. All of the specific sales for second quarter shipment have been made with the definite understanding that price in effect at time of shipment shall govern.

It was expected that the Carnegie-Illinois Steel Corp. would make an announcement of second quarter prices late last week, but an official statement by the company said that such announcement had been postponed until March 5. The unexpected turn of events in the labor situation undoubtedly provides the reason for this postponement, although it had been understood that price advances might precede wage increases. In all probability more time was required for the figuring out of cost factors, which, in addition to the labor element, are rising rapidly. Increasing prices for raw materials create a problem for the mills in figuring costs to a greater extent than increased labor costs, as some of the former cannot be accurately predicted, as in the case of nonferrous metals, for example. Iron ore is expected to be 50c. a ton higher (and even those companies with their own mines will have an additional labor cost for mining to consider), scrap has been advancing steadily and coal costs will be higher if the United Mine Workers Union prevails in its demands.

Under these circumstances, there is no information available at this writing on which to base a reliable prediction as to the amount of the prospective price rises, but it is likely that semi-finished steel will be marked up $2 or $3 a ton; bars, shapes and plates, $3 or $4, hot rolled and cold rolled sheets at least $4, galvanized sheets probably $6. The steel pipe situation is particularly indefinite, but it is regarded as fairly certain that discounts will be lowered 3½ points, equivalent to an increase in price of $7 a ton, which is the amount of the reduction that was made early in 1936. A few weeks ago it was thought that only buttweld and lapweld pipe would be advanced, but it now appears that seamless may also go up.

The new situation as to labor costs and prices will present a difficult problem for non-integrated makers of tin plate. The current price for sheet bars is $4 a ton higher than a year ago and a further advance of $2 or $3, plus two wage increases within the past few months, have brought tin plate manufacturing costs to a high level. Nonintegrated makers have had to absorb extra costs, but the tin plate price has not gone up; on the contrary the net return is lower owing to reductions recently in some of the extras for the lighter gages.

Export buying of steel, although temporarily checked by the unwillingness of sellers to commit themselves until domestic sales prices are known, is one of the features of the current situation. Cable inquiries from all over the world indicate a worldwide need for steel. Many countries are unable to get deliveries desired from European mills. Substantial premiums over domestic prices are being obtained. Shipping space is hard to obtain, and chartered boats have asked as high as $8.50 a ton for Far East shipments against a conference rate of $5, which will be increased to $6 July 1. The reexport allowance on steel has been reduced to $2 a ton.

One of the significant features of the new price situation is that mills are unwilling to protect contractors at present prices on building jobs or railroad equipment. Such protection was given at the time of the previous advance, with the result that the mills were loaded up with a great deal of low-priced tonnage, some of which may not be shipped until the second or third quarter. In this instance the mills seem determined to get the higher prices as quickly as possible or profits will suffer.

A large amount of railroad equipment for private companies is being figured on at the moment. How much of this will go ahead if the higher steel prices are exacted remains to be seen.

Pig Iron

The action of producers in advancing pig iron $1 a ton last week for shipment during the remainder of the current quarter only has led consumers to expect a further advance for second quarter delivery. As a consequence, demand has been heavy over the past week, and, with books not yet opened for second quarter, furnaces have had to turn down thousands of tons of new domestic inquiry. Some furnaces have virtually withdrawn from the market. Regardless of mounting prices, foreign interest in American iron continues unabated. A Japanese steel plant is reliably reported to have settled for 165,000 tons in this country since the year began, and more recently England is stated to have placed a large order. New inquiry from Sweden and South Africa has appeared, but cannot at present find a seller. Recent sales to foreign buyers have netted sellers as high as $2 a ton above prevailing domestic quotations, but, in some instances, at least, furnaces

are now disregarding foreign inquiry altogether and are attempting to develop new customers in the domestic fold with whatever spare offerings they may have. Reason for this action is that establishment of new domestic connections will prove a better long time investment. As definite shortage in the supply already exists and should intensify later, some in the trade are predicting that the next increase well may be from $2 to $3 a ton.

Cast Iron Pipe

Bids on about 250 tons of 8 in. to 16 in. pipe, including fittings, were opened today (Tuesday) in conjunction with the West Street elevated highway between Cedar and Spring Streets, Manhattan. Bids were taken Feb. 24 on 14,000 ft. of 4 in. to 12 in. pipe, about 210 tons, by the City of Cicero, N. Y., for water main extensions. Few other large jobs have developed in this market recently. Prices continue firm, with the outlook ahead for possible higher prices as raw materials costs increase.

Reinforcing Bars

The 1000 tons of bars for the Cocoa Cola building in Kearny, N. J., has been awarded to Joseph T. Ryerson & Son, Inc. This same company has obtained about 250 tons of reinforcing steel for a Department of Sanitation garage at 12th Avenue and 56th Street. Price cutting is still prevalent in this district, and large jobs seem always to bring out quotations much lower than the published price.

Reciprocal Tariff Legislation Extended

WASHINGTON, March 2.—Reciprocal tariff legislation was signed yesterday by President Roosevelt. It extends for three years from June 12 the President's authority to negotiate reciprocal tariff agreements without ratification by the Senate.

The American Zinc Institute, Inc., will hold its 19th annual meeting at the Hotel Statler, St. Louis, on April 26 and 27. The institute's committee on galvanizing will continue its own program through April 28.

Crown Cork & Seal Co., Baltimore, made net profit in 1936 of $5,277,534 after interest, depreciation, Federal income tax and surtax on undistributed profit, equivalent to $4.36 a share of common stock. This compares with $3,434,912 in 1935, or $2.84 a share.

. . . CLEVELAND . . .

. . . Buyers trying to cover prior to price advances; mills well sold up.

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. . . 1937 ore price may not be announced until after steel price rise.

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. . . Another advance in pig iron for second quarter shipment expected.

CLEVELAND, March 2. — With wage advances announced by leading steel producers, the increased production costs will be reflected in the price advances for the second quarter to be made this week. As the Carnegie-Illinois Steel Corp. has announced that it will name prices Friday, it seems probable that other producers will defer action until that date.

While pig iron prices have been marked up $1 a ton for March shipment, producers have not yet named second quarter prices. Prices of Jackson County silver iron and bessemer ferrosilicon were advanced $2 a ton today for March shipment, second quarter quotations not yet having been named.

Announcement of ore prices for the season may be deferred until steel prices are named, although the Ford Motor Co. has asked for quotations tomorrow on its inquiry for 315,000 tons. The talk is of a 50c.-a-ton advance, the first in eight years. The new wage increase, which presumably will be put in effect in the ore mines, will add to production costs.

Ingot output was stepped up two points this week to 82 per cent in the Cleveland-Lorain district and also two points to 85 per cent in the Youngstown district, where it is one point above the December record.

Demand for some steel products showed an upward trend the past week, although the volume of business was restricted because most of the mills are filled up on nearly all products for March and are taking no orders they cannot fill during the current month, except for sheets and strip steel. Business in hot-rolled bars has increased, buyers being anxious to get orders on the books for March production at present prices. Considerable new business in sheets and strip steel has come from the automotive industry, subject to prices prevailing at time of shipment. Deliveries generally are no better and on sheets are getting further behind. Demand for pipe has become more active, but March deliveries can still be secured.

Bars, Plates and Shapes

A probable price advance for the second quarter has stimulated the demand, particularly for hot-rolled bars. While bar orders can still be placed for March shipment, most of the mills are filled up and out of the market for March delivery and will take no business for the second quarter until the price is named. Mills are also well filled with cold-finished bars, although some can take a little more tonnage for March shipment. Fabricators continue to issue good specifications for structural shapes, largely for work covered by price protection. New inquiry for construction work is light. Grade-crossing work in Akron, requiring 1100 tons of structural shapes and reinforcing bars, will be advertised because bids exceeded the State engineer's estimate. Plate orders are in good volume.

Pig Iron

Furnaces are refusing to load up their order books with iron at the $1-a-ton price advance for the remainder of the quarter, although they have taken some small-lot orders from consumers who actually need the iron this month. Some inquiry from foundries not needing the iron has been turned down. Announcement of second quarter prices, expected March 1, has not

yet been made. Some second quarter inquiry has come out and an active buying movement is expected as soon as prices are named for that delivery. Producers of Jackson County silvery pig iron and bessemer ferrosilicon have advanced prices $2 a ton on all grades for March shipment only. They have made no price announcement for the second quarter.

Sheets

New business continues to come out in heavy volume, although buyers do not have the incentive of protecting themselves against price advances, because with mills fully committed for March all the business that is now being taken is being entered for the second quarter delivery at prices prevailing at the time of shipment. Automobile manufacturers placed considerable new business during the week, but apparently did not buy in excess of their normal requirements. In addition, General Motors plants released for March shipment considerable tonnage that had been suspended, space for which had been reserved in the rolling schedules. Some mills are turning down second quarter business because, owing to the uncertainty of production costs, they do not want to be loaded up at present with a great deal of second quarter business. Premium prices have been offered for small lots for quick shipment, in one case as much as $10 a ton. Deliveries have been extended to 20 weeks by some mills on some products.

Strip Steel

Demand took quite a spurt the past week. Good orders for both hot and cold rolled strip came from the automobile and parts manufacturers and mills also booked a lot of miscellaneous orders. Deliveries have been extended well into April and to around May 1 by some producers. Automobile parts makers in placing new orders ask for deliveries as soon as the strip can be produced. Orders are being taken subject to prices prevailing at the time of shipment.

Bolts and Nuts

With heavy releases of orders that were held up by General Motors plants shipments have increased and new business is showing some gain. Jobbers who have been out of the market for some time, having stocked up before the last price advance, are starting to place new orders. A price advance for the second quarter is already being discussed and seems probable because of the higher prices for wire rods, the advance of $2 to $4 a ton in size extras on wire and the probable advance on steel bars.

..SAN FRANCISCO..

. . . Lettings may be more numerous this month.

SAN FRANCISCO, March 1.—March lettings promise to regain normalcy on the Pacific Coast, particularly in the cast iron pipe market. Los Angeles will open bids March 11 on 60,000 ft. of 12-in. and 32,000 ft. of 8-in. cast iron pipe under the Department of Water and Power specification X-93. Total amount will be 3524 tons. On March 10 the East Bay Municipal Utilities District of Oakland, Calif., will open bids on 1000 tons of 4, 6, 8, 10, and 12-in. pipe. This project is part of an extensive water supply system.

MacDonald & Kahn Co., Ltd., has been awarded the general contract for an Air Corps engineering Shop and repair dock at the Sacra-

mento, Calif., airport. Approximately 5000 tons of structural steel and 250 tons of reinforcing bars are called for in this $1,500,000 project and will be awarded soon. Bids have been opened on 927 tons of bars involved in three invitations on the Salt River reclamation project at Phoenix, Ariz.

Only important awards of the past week were: 900 tons of plates for tanks and bin structures on an industrial plant for Westvaco Chlorine Products Corp., Neward, Calif., to Western Pipe & Steel; and 313 tons of reinforcing bars for the All-American Canal project, to Colorado Fuel & Iron Co. Many small jobs kept the market active in all forms of steel.

Considerable interest is being shown in President Roosevelt's public works program, which includes approximately $100,000,000 for immediate work in California, including $35,000,000 for Los Angeles County flood control work. Deferred construction recommended amount to $37,045,000, and a total of $175,216,000 for later work on projects on the immediate list is included.

. . . Business active in all industrial lines.

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. . . Another advance in pig iron prices expected.

TORONTO, March 2.—A sharp increase in iron and steel demand has followed the placing of orders by the railroads for some $35,000,000 in new equipment, and additional contracts for raw materials are pending. The improvement in business also has had a stimulating effect on prices of most lines of iron and steel, and it is understood that mills are taking contracts for forward delivery only to the end of this quarter. In addition to the heavy buying from the railroad equipment makers, there is a growing demand for steel from the automotive industry, and the mining companies are continually placing orders for steel and machinery. Canadian Locomotive Co., Kingston, Ont., has received orders for locomotives that will keep its plant at full time for several months. Building trades also are showing improvement and sales of structural steel are increasing steadily. Agricultural implement makers are stepping up operations and are placing substantial orders for raw materials.

Demand for merchant pig iron continues to expand, and it is stated that spot sales for the past week reached a total of approximately 1800 tons. Present business, however, chiefly is for spot delivery, but inquiries are appearing for second quarter, although no awards have been made. There is some feeling that another advance in iron price in the Canadian markets is pending. Scarcity of some lines of scrap tends to stimulate iron sales, especially foundry grades. Pig iron production is holding at its peak level, with output for January in excess of 66,000 tons. Imports continue small.

Trading in iron and steel scrap continues active. Local dealers state that they now are selling much larger tonnages than are being offered by producers and the small accumulators. Some material is going into the yards for sorting, but the greater part of recent purchases has gone direct to consumers. Steel grades are in good demand and large tonnage shipments are being made to the mills against old contracts, and these are being increased by new buying.

. . . Available supplies are not equal to demand.

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. . . Higher prices generally expected by June.

LONDON, March 2 (*By Cable*)—The supply of iron and steel is outdistanced by the demand. The pig iron rationing system is working fairly smoothly but consumers are receiving only their most urgent needs. There is no early prospect of additional tonnages for the open market and business meanwhile is at a standstill. Higher prices are generally expected after June. The pressure for steel supplies is growing and commercial consumers fear that Government requirements may receive priority.

The current quarter imports of Continental semi-finished steel are still behind the quota, and rerollers' operations are curtailed as British works are unable to supply the deficit. Consequently finished steel makers are having difficulties meeting the huge demand and they are refusing business.

British Iron and Steel Federation advised consumers that revised steel prices will become effective May 31, and that undelivered steel at that date will be liable to the increase.

Under the recent scrap agreement prices have been stabilized on a basis of the current official prices and members have agreed not to export.

Unfilled orders on tin plate exceed 7,000,000 base boxes, and the demand continues fair, but the steel shortage is handicapping production and some works are operating intermittently.

Continental iron and steel works are fully sold up to May or June and are accepting only small business.

English prices of finished iron except market bars have been raised 27s. 6d., Scottish prices, 37s. 6d.

Continental gold prices are unchanged.

. . . Mystic Furnace advances pig iron $1 a ton.

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. . . Warehouses announce higher prices on galvanized sheets.

BOSTON, March 2.—The Mystic Iron Works on Feb. 25 advanced pig iron $1 a ton to $23.75 a ton, base, on cars Everett, first quarter delivery only. Other iron producers previously had advanced $1 a ton. No furnaces endeavored to sell iron before the advance, and, as most foundries are covered for the first quarter, business was confined to small lots.

Although no official announcement has been made, it is quite probable the Mystic Iron Works will blow in its stack within a month. The company has sufficient ore on hand to make a substantial tonnage of iron.

Warehouses have again advanced galvanized steel sheets, this time from 4.80c. to 5.05c., base, which compares with 4.55c. on Jan. 1.

. . . NON-FERROUS . . .

. . . *Lead prices boosted $10 a ton during week.*

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. . . *Sale of zinc reported at $4 a ton increase.*

NEW YORK, March 2.—All producers now recognize 15c. as the market price for electrolytic, delivered Connecticut Valley, though, as regards trading, copper is in no more free supply than it was a week ago. In the outside market, sales are reported occasionally at higher than the 15c. level, but in undeterminable quantity. Domestic sales reported yesterday totaled 1208 tons. Total sales in February were 74,988 tons, against 53,810 tons in January, and the price rose last month from 13.00c. to 15.00c. Lessening in foreign activity was reported during the week, with the export price off at one point but tending to strengthen currently. An export transaction was reported this morning at as high as 16.05c., c.i.f., Europe, but for the most part prices ranged beneath this limit.

Lead

Prices of pig lead in the domestic market were advanced $10 a ton on Feb. 25 to 6.85c. a lb., St. Louis, and 7.00c. and 7.05c., New York, the latter quotation representing premium secured by the largest producer on certain of its brands sold in the East. Consumers bought heavily on the rise, and have since continued to take substantial tonnages. After selling liberally today, certain producers withdrew from the market with waiting lists on hand for tomorrow's attention. Sales are now for shipment limited to the current month.

Zinc

A majority of producers continue to restrict prices to 6.80c., East St. Louis basis, but have little metal to sell. In one direction, however, a sale was transacted this morning at 7c., or $4 a ton above the current market, so that the situation again appears to be getting out of hand and may force uniform increase in the quotation momentarily. Demand is not large, but scant offerings permit possibility of bettering present quotations in some instances. Producers as a whole are opposed to such action, though an increase may come regardless. Sales of spelter last week aggregated around 4800 tons, and shipments were about 8200 tons.

Tin

Fair buying occurred during the week, with consumers showing preference for no particular positions. Prices fluctuated between 55.25c. and 54.12½c., the latter quotation applying at the close on March 1. Price of spot Straits metal at New York today is about 54.75c. a lb. while official London prices this morning were £244 10s. for standard cash and £245 10s. for three-months. The Eastern price was £247 12s. 6d. American tin deliveries in February totaled 7675 tons, an increase of 60 tons over January and 2075 tons over February, 1936. The world's visible supply dropped 2405 tons during the month to 23,774 tons at the period's end.

The Week's Prices. Cents Per Pound for Early Delivery

	Feb. 24	Feb. 25	Feb. 26	Feb. 27	Mar. 1	Mar. 2
Electrolytic copper, Conn.*	15.00	15.00	15.00	15.00	15.00	15.00
Lake copper, N. Y.	15.12½	15.12½	15.12½	15.12½	15.12½	15.12½
Straits tin, spot, New York	54.62½	55.25	54.75	....	54.12½	54.75†
Zinc, East St. Louis	6.80	6.80	6.80	6.80	6.80	6.80
Zinc, New York	7.15	7.15	7.15	7.15	7.15	7.15
Lead, St. Louis	6.35	6.85	6.85	6.85	6.85	6.85
Lead, New York	6.50	7.00	7.00	7.00	7.00	7.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Nominal.

Aluminum, virgin 99 per cent plus 20.00c. -21.00c. a lb. delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 17.00c. a lb. delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 16.50c. a lb., New York.
Quicksilver, $90.00 to $92.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 16.25c. a lb. delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse
Delivered Prices, Base per Lb.

Tin, Straits pig	56.00c. to 57.00c.
Tin, bar	58.00c. to 59.00c.
Copper, Lake	16.50c. to 17.50c.†
Copper, electrolytic	16.50c. to 17.50c.†
Copper, castings	16.25c. to 17.25c.†
*Copper sheets, hot-rolled	22.62½c.†
*High brass sheets	20.12½c.†
*Seamless brass tubes	22.87½c.†
*Seamless copper tubes	23.37½c.†
*Brass rods	16.50c.†
Zinc, slabs	7.75c. to 8.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	12.75c.
Lead, American pig	8.00c. to 9.00c.
Lead, bar	9.00c. to 10.00c.
Lead, sheets, cut	8.75c.
Antimony, Asiatic	17.50c. to 18.50c.
Alum., virgin, 99 per cent plus	24.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	35.00c. to 36.00c.
Babbitt metal, commercial grades	25.00c. to 65.00c.

† Nominal.
* These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse
Delivered Prices per Lb.

Tin, Straits pig	58.25c.
Tin, bar	60.25c.
Copper, Lake	16.00c. to 16.25c.†
Copper, electrolytic	16.00c. to 16.25c.†
Copper, castings	15.75c. to 16.00c.†
Zinc, slabs	8.25c. to 8.75c.
Lead, American pig	7.00c. to 7.25c.
Lead, bar	9.75c.
Antimony, Asiatic	18.25c. to 18.50c.
Babbitt metal, medium grade	24.25c.
Babbitt metal, high grade	62.25c.
Solder, ½ and ½	35.00c.

† Nominal.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	12.12½c.	12.87½c.
Copper, hvy. and wire	12.00c.	12.50c.
Copper, light and bottoms	11.00c	11.25c.
Brass, heavy	7.12½c.	7.75c.
Brass, light	6.25c.	7.00c.
Hvy. machine composition	11.00c.	11.50c.
No. 1 yel. brass turnings	8.37½c.	8.87½c.
No. 1 red brass or compos. turnings	10.87½c.	11.37½c.
Lead, heavy	5.50c.	5.87½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c.	14.75c.
Zinc	4.00c.	4.37½c.

February Averages

Electrolytic copper, Conn.*	13.695c. a lb.
Lake copper, Eastern delivery	13.820c. a lb.
Straits tin, spot, New York	52.096c. a lb.
Zinc, East St. Louis	6.452c. a lb.
Zinc, New York	6.802c. a lb.
Lead, St. Louis	6.078c. a lb.
Lead, New York	6.228c. a lb.

* Price ¼c. lower in New York.

IRON AND STEEL SCRAP

. . . Rise of $1 at Pittsburgh lifts composite from $19.92 to $20.25.

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. . . Several markets show signs of leveling off.

MILL buying in the Pittsburgh area has lifted quotations on steel-making grades there by $1 a ton, which is reflected in a 33c. advance in the composite figure to $20.25 a gross ton. Although most other areas continue to display a similar undertone, there are nevertheless several points which lately have shown some signs of uncertainty. At Chicago, a free flow of material at current price levels has tended to limit bullish sentiment somewhat, and St. Louis prices have all been marked down 25c. a ton. The export situation in the East is complicated to some extent by a shortage of boats and rapid build-up of accumulations at docks. About 400 cars are awaiting unloading at Boston piers, and from 1300 to 1600 cars are on sidings at Port Richmond, Philadelphia, awaiting the arrival of boats. This rail congestion has forced several railroads to clamp down temporary embargoes on further shipments until loadings onto boats clear up some space on sidings. These embargoes are reflected in a release of additional material for domestic consumption.

Chicago

Unusual strength continues to feature the local market, despite reports of a somewhat better supply situation owing to the attraction of high prices in the dealer market. The market for No. 1 steel is becoming increasingly difficult to determine. Reports of prices at which material has been sold into consumption vary as much as $1 a ton, and the extent to which current broker activity represents covering of short commitments appears to be in doubt.

Pittsburgh

With two mills buying substantial tonnages of No. 1 steel and compressed sheets at $22 in the past week, the market has moved up $1 a ton. Those dealers with short orders are running into difficulty in obtaining steel and are paying $21 or more a ton. With a phenomenal market like that which has existed for the past few weeks, the customary spread between certain items does not exist. For the time being demand and sales for No. 2 steel in this district place it at fully $3 a ton below the quotation for No. 1. The same situation applies with respect to other items such as hand bundled sheets and heavy axle turnings. The market for cast grades is exceptionally strong with some items being marked up 50c. to $1 a ton.

Cleveland

The market continues very firm, and while no sales to consumers during the week are reported, the prices that brokers are paying indicate that the prices that mills will have to pay will be higher than the prices of their last purchases. While quotations on heavy melting steel are unchanged, other steel-making grades and blast furnace scrap have advanced 50c. a ton. Brokers are paying $20 for No. 1 heavy melting steel for Youngstown and $18.50 for Cleveland. Large lists for March were offered by Michigan automobile companies last week and are reported to have brought high prices.

Buffalo

Dealers who have made recent heavy sales are encountering difficulty in bringing in scrap from some customary sources due to heavy outside demand. Material cannot be brought from east of Syracuse because export demand is heavier and freight rates on material for export are lower. South and west of the Buffalo territory, the scrap goes into Youngstown. Dealers are reluctant to sell at present prices, and the market is very firm.

Boston

With the army base clogged with more than 400 cars, the railroads have clamped an embargo on exporters, which has slowed up scrap dealings. As soon as vessels arrive and clean up the congestion, the embargo will be lifted. A steamer is due today at Providence to load scrap for abroad. The movement of barge scrap from that port to New York is active. For Pennsylvania delivery, steel turnings, mixed borings and turnings and bundled skeleton are priced higher. The advance in No. 1 heavy melting steel at Pittsburgh is not reflected here.

Philadelphia

Export buyers have raised their offers 50c. a ton to $18.50 and $17.50 for No. 1 and No. 2 steel respectively, although the domestic price is unchanged. The leading district consumer, however, has advanced his buying price for No. 1 steel to $18.50 to $19. A temporary embargo has been placed on shipments to Port Richmond by the Reading Railroad because of car congestion there arising from exporters' inability to secure boats quickly enough to dispose of their accumulations. From 1300 to 1600 cars are now on sidings awaiting unloading. About 10 boats are expected during March, however, so the ban on shipments should not be of long duration. The March accumulation of 5000 tons of new bundles of the Budd company is understood to have been split among three buyers, who paid about $18.75 f.o.b.

New York

A still stronger undertone prevails here, and dealers have advanced buying prices on principal steel mill and foundry grades from 50c. to $1 a ton. Certain grades used by rolling mills have also mounted. For No. 1 steel loaded on cars, buying prices are now $15.50 to $16, whereas for material delivered alongside barges the range is from $15 to $15.50. Some dealers are reported not in the market for heavy melting steel for domestic shipment at prevailing top prices, since at these levels profits are hazardous.

Detroit

The local market continues strong, and principal grades have advanced an average of 50c. Over 200 cars of bundles were bought by a Cincinnati broker at a reputed price of $17.50 a ton, representing an advance of 75c. over previous quotations. With local mills staying out of the consuming market, out-of-town buying continues to be a prominent feature. An 1800-ton boatload of mixed borings and short turnings was shipped March 1 to a Cleveland consumer, and thus was the first boatload to leave Detroit this season. The first boat for Buffalo leaves March 15.

Cincinnati

Feverish activity reported in other areas strengthened this market's undertone the past week. Dealers' bids have been advanced 25c. to $2 a ton. Sales are small, but shipments are moving on old contract at a moderate rate.

St. Louis

The steady upward climb of prices was checked this week, when all steel prices were reduced 25c. a ton in an easier market. The weakness is due to the fact that scrap iron is coming in very freely, according to dealers.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$21.50 to $22.00
Railroad hvy. mltng. ..	22.00 to 22.50
No. 2 hvy. mltng. steel.	18.50 to 19.00
No. 2 RR. wrought	21.50 to 22.00
Scrap rails	21.50 to 22.00
Rails 3 ft. and under..	24.50 to 25.00
Comp. sheet steel	21.50 to 22.00
Hand. bundled sheets.	19.50 to 20.00
Hvy. steel axle turn...	19.75 to 20.25
Machine shop turn.....	14.50 to 15.00
Short shov. turn.....	15.00 to 15.50
Mixed bor. & turn.....	14.00 to 14.50
Cast iron borings	14.00 to 14.50
Cast iron carwheels....	19.00 to 19.50
Hvy. breakable cast....	16.00 to 16.50
No. 1 cast	18.50 to 19.00
RR. knuckles & cplrs..	25.50 to 26.00
Rail coil & leaf springs	25.50 to 26.00
Rolled steel wheels....	25.50 to 26.00
Low phos. billet crops.	26.00 to 26.50
Low phos. sh. bar....	25.00 to 25.50
Low phos. punchings..	24.00 to 24.50
Low phos. plate, hvy...	24.50 to 25.00
Low phos. plate clip..	23.00 to 23.50
Steel car axles	24.00 to 24.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$18.00 to $18.50
No. 2 hvy. mltng. steel.	17.00 to 17.50
Comp. sheet steel	17.00 to 17.50
Light bund. stampings	13.00 to 13.50
Drop forge flashings...	17.50 to 18.00
Machine shop turn.....	12.75 to 13.25
Short shov. turn.	13.25 to 13.75
No. 1 busheling	17.00 to 17.60
Steel axle turnings	15.00 to 15.50
Low phos. billet crops	22.00 to 22.50
Cast iron borings	13.25 to 13.75
Mixed bor. & turn. ...	13.25 to 13.75
No. 2 busheling	13.25 to 13.75
No. 1 cast	20.50 to 21.00
Railroad grate bars...	12.00 to 12.50
Stove plate	10.00 to 10.50
Rails under 3 ft.	24.50 to 25.00
Rails for rolling	21.50 to 22.00
Railroad malleable ...	20.00 to 20.50
Cast iron carwheels....	18.50 to 19.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$18.50 to $19.00
No. 2 hvy. mltng. steel.	17.50 to 18.00
Hydraulic bund., new.	18.00 to 18.50
Hydraulic bund., old..	16.00 to 16.50
Steel rails for rolling..	18.50 to 19.00
Cast iron carwheels..	18.50 to 19.00
Hvy. breakable cast ..	18.00 to 18.50
No. 1 cast.....	19.00 to 19.50
Stove plate (steel wks.)	14.50 to 15.00
Railroad malleable	18.50 to 19.00
Machine shop turn....	12.50 to 13.00
No. 1 blast furnace	11.50 to 12.00
Cast borings	11.50 to 12.00
Heavy axle turnings..	17.50 to 18.00
No. 1 low phos. hvy....	24.00 to 24.50
Couplers & knuckles ..	24.50 to 25.00
Rolled steel wheels ...	24.50 to 25.00
Steel axles	24.50 to 25.00
Shafting	23.00 to 23.50
No. 1 RR. wrought ...	18.50 to 19.00
Spec. iron & steel pipe	16.50 to 17.00
No. 1 forge fire	16.50 to 17.00
Cast borings (chem.).	12.00 to 13.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$20.00 to $20.50
Auto. hvy. mltng. steel.	19.00 to 19.50
Alloy free	18.50 to 19.00
Shoveling steel	20.00 to 20.50
Hydraul. comp. sheets.	19.50 to 20.00
Drop forge flashings..	16.50 to 17.00
No. 1 busheling	18.00 to 18.50
Rolled carwheels	22.00 to 22.50
Railroad tires, cut	22.25 to 22.75
Railroad leaf springs..	22.00 to 22.50
Axle turnings	18.50 to 19.00
Steel coup. & knuckles	22.00 to 22.50
Coil springs	24.00 to 24.50
Axle turn. (elec.)	19.25 to 19.75
Low phos. punchings..	23.00 to 23.50
Low phos. plates, 12 in. and under	23.00 to 23.50
Cast iron borings	11.25 to 11.75
Short shov. turnings..	12.50 to 13.00
Machine shop turn. ...	10.75 to 11.25
Rerolling rails	21.50 to 22.00
Steel rails under 3 ft...	21.75 to 22.25
Steel rails under 2 ft...	23.00 to 23.50
Angle bars, steel	21.25 to 21.75
Cast iron carwheels ..	19.50 to 20.00
Railroad malleable	21.75 to 22.25
Agric. malleable	18.75 to 19.25
Iron car axles	26.50 to 27.00

	Per Net Ton
Steel car axles	$22.50 to $23.00
No. 1 RR. wrought....	18.50 to 19.00
No. 2 RR. wrought....	18.50 to 19.00
No. 2 busheling, old..	9.00 to 9.50
Locomotive tires	19.50 to 20.00
Pipes and flues	14.50 to 15.00
No. 1 machinery cast...	17.00 to 17.50
Clean auto. cast	15.50 to 16.00
No. 1 railroad cast	15.75 to 16.25
No. 1 agric. cast	13.50 to 14.00
Stove plate	12.25 to 12.75
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	$18.50 to $19.00
No. 2 hvy. mltng. steel.	17.00 to 17.50
Scrap rails	18.50 to 19.00
New hy. b'ndled sheet	17.00 to 17.50
Old hydraul. bundles ..	16.00 to 16.25
Drop forge flashings ..	17.00 to 17.50
No. 1 busheling	17.00 to 17.50
Hvy. axle turnings....	11.00 to 11.50
Machine shop turn ...	12.50 to 12.75
Knuckles & couplers..	21.00 to 21.50
Coil & leaf springs....	21.00 to 21.50
Rolled steel wheels....	21.00 to 21.50
Low phos. billet crops.	21.50 to 22.00
Shov. turnings	13.50 to 14.00
Mixed bor. & turn.	12.50 to 12.75
Cast iron borings	12.50 to 12.75
Steel car axles	20.50 to 21.00
No. 1 machinery cast..	18.50 to 19.00
No. 1 cupola cast	17.00 to 17.50
Stove plate	13.50 to 14.00
Steel rails under 3 ft...	21.50 to 22.00
Cast iron carwheels...	16.00 to 16.50
Railroad malleable	18.50 to 19.00
Chemical borings	13.00 to 13.50

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.....	$15.00 to $15.50
Scrap steel rails	15.00 to 15.50
Short shov. turnings ..	7.50 to 8.00
Stove plate	8.50 to 9.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought....	12.50 to 13.00
Rails for rolling	16.00 to 17.00
No. 1 cast	14.50 to 15.00
Tramcar wheels	.... 14.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:

Selected hvy. steel....	$17.75 to $18.25
No. 1 hvy. melting....	17.25 to 17.75
No. 2 hvy. melting....	15.00 to 15.50
No. 1 locomotive tires..	18.00 to 18.50
Misc. stand.-sec. rails.	18.00 to 18.50
Railroad springs	20.00 to 20.50
Bundled sheets	11.00 to 11.50
No. 2 RR. wrought ...	17.50 to 18.00
No. 1 busheling	14.00 to 14.50
Cast bor. & turn.....	5.50 to 6.00
Rails for rolling	18.50 to 19.00
Machine shop turn....	7.50 to 8.00
Heavy turnings	12.50 to 13.00
Steel car axles	21.50 to 22.00
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	13.75 to 14.25
Steel rails under 3 ft. ..	19.00 to 19.50
Steel angle bars	18.00 to 18.50
Cast iron carwheels...	16.50 to 17.00
No. 1 machinery cast.	13.00 to 13.50
Railroad malleable ...	17.50 to 18.00
No. 1 railroad cast....	13.25 to 13.75
Stove plate	11.25 to 11.75
Agricul. malleable	12.50 to 13.00
Grate bars	11.50 to 12.00
Brake shoes	13.00 to 13.50

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$17.00 to $17.50
No. 2 hvy. mltng. steel.	14.75 to 15.25
Scrap rails for mltng..	17.50 to 18.00
Loose sheet clippings..	12.00 to 12.50
Bundled sheets	13.00 to 13.50
Cast iron borings	10.50 to 11.00
Machine shop turn.....	10.50 to 11.00
No. 1 busheling	14.00 to 14.50
No. 2 busheling	9.00 to 9.50
Rails for rolling	19.00 to 19.50
No. 1 locomotive tires.	16.00 to 16.50
Short rails	21.00 to 21.50
Cast iron carwheels....	16.00 to 16.50
No. 1 machinery cast ..	16.50 to 17.00
No. 1 railroad cast	15.50 to 16.00
Burnt cast	11.75 to 12.25
Stove plate	11.75 to 12.25
Agricult. malleable	16.50 to 17.00
Railroad malleable	17.50 to 18.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$15.50 to $16.00
No. 2 hvy. mltng. steel.	14.75 to 15.25
Borings and turnings..	12.00 to 12.50
Long turnings	11.50 to 12.00
Short shov. turnings..	12.75 to 13.25
No. 1 machinery cast..	15.50 to 16.00
Automotive cast	16.25 to 16.75
Hydraul. comp. sheets.	17.00 to 17.50
Stove plate	10.25 to 10.75
New factory bushel ...	16.00 to 16.50
Old No. 2 busheling ..	10.75 to 11.25
Sheet clippings	12.50 to 13.00
Flashings	15.50 to 16.00
Low phos. plate scrap.	18.00 to 18.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$19.50 to $20.00
Hydraulic bundles	19.00 to 19.50
Machine shop turn.....	15.00 to 15.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$15.50 to $16.00
No. 2 hvy. mltng. steel.	14.50 to 15.00
Hvy. breakable cast...	14.00 to 14.50
No. 1 machinery cast.	16.50 to 17.00
No. 2 cast	13.50 to 14.00
Stove plate	10.75 to 11.25
Steel car axles	23.00 to 24.00
Shafting	20.00 to 20.50
No. 1 RR. wrought ...	13.50 to 14.00
No. 1 wrought long....	13.50 to 14.00
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	17.00 to 17.50
Clean steel turnings...	8.75 to 9.25
Cast borings	8.75 to 9.00
No. 1 blast furnace	8.75 to 9.00
Cast borings (chem.)..	11.00 to 11.50
Unprepar. yard scrap.	10.50 to 11.00

Per gross ton, delivered local foundries:

No. 1 machn. cast.....	$16.00 to $16.50
No. 1 hvy. cast cupola.	13.50 to 14.00
No. 2 cast	13.00 to 13.50

Add 50c. to 75c. to above quotations to secure North Jersey prices.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$14.80 to $15.30
Scrap rails	14.80 to 15.30
No. 2 steel	13.05 to 13.25
Breakable cast	13.00 to 13.25
Machine shop turn.....	.... 8.95
Mixed bor. & turn.....	7.50 to 8.30
Bund. skeleton long....	.... 12.95
Shafting	16.75 to 17.00
Cast bor. chemical.....	7.00 to 8.75

Per gross ton delivered consumers' yards:

Textile cast	$16.50 to $18.00
No. 1 machine cast ...	16.50 to 18.00
Stove plate	10.00 to 10.50

CANADA

Dealers' buying prices at their yards, per gross ton

	Toronto	Montreal
No. 1 hvy. mltg. stl...	$12.00	$11.50
No. 2 hvy. mltg. stl...	11.00	10.00
Mixed dealers steel....	10.00	9.75
Scrap pipe	9.25	9.25
Steel turnings	7.50	7.00
Cast borings	8.00	7.75
Machinery cast	16.00	15.50
Dealers cast	14.00	13.50
Stove plate	11.50	11.00

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges.

No. 1 hvy. mltng. steel.	$15.00 to $15.50
No. 2 hvy. mltng. steel.	14.00 to 14.50
No. 2 cast	13.00 to 13.50
Stove plate	11.00 to 11.50
Steel rails (scrap)	15.00 to 15.50

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	$16.25 to $16.50
No. 2 hvy. mltng. steel.	15.25 to 15.50
Rails (scrap)	.... 16.50
Stove plate	7.75 to 8.00

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel.	.... $18.50
No. 2 hvy. mltng. steel.	.... 17.50

New Orleans, on cars at Stuyvesant Dock

No. 1 hvy. mltng. steel.	.... $14.25
No. 2 hvy. mltng. steel.	.... 13.25

Los Angeles, on cars or trucks at local piers

No. 1 hvy. mltng. steel.	$10.50 to $11.00
Compressed bundles ..	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Lb.
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.80c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$43.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	44.00
F.o.b. Worcester, Mass.	45.00
F.o.b. Birmingham	46.00
F.o.b. San Francisco	52.00
F.o.b. Galveston	49.00

Rods over 9/32 in. to 47/64 in., inclusive, $4 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	2.20c.
F.o.b. Chicago or Gary	2.25c.
F.o.b. Duluth	2.35c.
Del'd Detroit	2.35c.
F.o.b. Cleveland	2.25c.
F.o.b. Buffalo	2.30c.
Del'd Philadelphia	2.49c.
Del'd New York	2.55c.
F.o.b. Birmingham	2.35c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars Pacific ports	2.75c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	2.05c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	2.10c.
F.o.b. Buffalo	2.15c.
F.o.b. Birmingham	2.20c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.60c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.25c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.30c.
Del'd Detroit	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.65c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.10c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.15c.
F.o.b. cars dock Gulf ports	2.50c.
F.o.b. cars dock Pacific ports	2.50c.

Iron

F.o.b. Chicago	2.15c.
F.o.b. Pittsburgh (refined)	3.25c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.55c.
F.o.b. Cleveland, Chicago and Gary	2.60c.
F.o.b. Buffalo	2.65c.
Del'd Detroit	2.70c.
Del'd eastern Michigan	2.75c.

* In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago or Gary	2.10c.
Del'd Cleveland	2.235c.
F.o.b. Coatesville or Spar. Pt.	2.15c.
Del'd Philadelphia	2.235c.
Del'd New York	2.33c.
F.o.b. Birmingham	2.20c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.60c.
Wrought iron plates, f.o.b. Pittsburgh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.60c.
F.o.b. Chicago	3.65c.
F.o.b. Coatesville	3.70c.
F.o.b. cars dock Gulf ports	4.00c.
F.o.b. cars dock Pacific ports	4.15c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
Del'd Cleveland	2.235c.
F.o.b. Buffalo or Bethlehem	2.15c.
Del'd Philadelphia	2.255c.
Del'd New York	2.305c.
F.o.b. Birmingham (standard)	2.20c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.60c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.40c.
F.o.b. Chicago or Buffalo	2.50c.
F.o.b. cars dock Gulf or Pacific Coast ports	2.85c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton $39.00
Angle bars, per 100 lb. ... 2.55c. to 2.70c.

F.o.b. Basing Points

Light rails (from billets) per gross ton $38.00
Light rails (from rail steel) per gross ton 37.00

	Base per Lb.
Spikes	2.90c.
Tie plates, steel	2.10c.
Tie plates, Pacific Coast ports	2.20c.
Track bolts, to steam railroads	4.00c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	2.15c.
No. 10, f.o.b. Gary	2.25c.
No. 10, del'd Detroit	2.35c.
No. 10, del'd Philadelphia	2.46c.
No. 10, f.o.b. Birmingham	2.30c.
No. 10, f.o.b. cars dock Pacific ports	2.70c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.80c.
No. 24, f.o.b. Gary	2.90c.
No. 24, del'd Detroit	3.00c.
No. 24, del'd Philadelphia	3.11c.
No. 24, f.o.b. Birmingham	2.95c.
No. 24, f.o.b. cars dock Pacific ports	3.45c.
No. 24, wrought iron, Pittsburgh	4.50c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.80c.
No. 10 gage, f.o.b. Gary	2.90c.
No. 10 gage, f.o.b. Detroit	3.00c.
No. 10 gage, del'd Philadelphia	3.11c.
No. 10 gage, f.o.b. Birmingham	2.95c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.40c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	3.25c.
No. 20 gage, f.o.b. Gary	3.35c.
No. 20 gage, del'd Detroit	3.45c.
No. 20 gage, del'd Philadelphia	3.56c.
No. 20 gage, f.o.b. Birmingham	3.40c.
No. 20 f.o.b. cars dock Pacific ports	3.80c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.40c.
No. 24, f.o.b. Gary	3.50c.
No. 24, del'd Philadelphia	3.71c.
No. 24, f.o.b. Birmingham	3.55c.
No. 24, f.o.b. cars dock Pacific ports	4.00c.
No. 24, wrought iron, Pittsburgh	5.15c.

Electrical Sheets
(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.70c.
F.o.b. Gary	3.80c.
F.o.b. cars dock Pacific ports	4.40c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.20c.
No. 20, f.o.b. Gary	3.30c.
No. 20, f.o.b. Birmingham	3.80c.
No. 20, f.o.b. cars dock Pacific ports	3.80c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.95c.
No. 28, Gary	3.05c.
No. 28, cars dock Pacific ports, boxed	3.825c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$4.85
Standard cokes, f.o.b. Gary	4.95

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes
Manufacturing Ternes

	Per Base Box
F.o.b. Pittsburgh	*$4.15
F.o.b. Gary	* 4.25

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Terne Plate
(*F.o.b. Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strip and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	2.15c.
All widths up to 24 in., Chicago	2.25c.
All widths up to 24 in., del'd Detroit	2.35c.
All widths up to 24 in., Birmingham	2.30c.
Cooperage stock, Pittsburgh	2.25c.
Cooperage stock, Chicago	2.35c.

Cold-Rolled Strip*

	Base per Lb.
F.o.b. Pittsburgh	2.85c.
F.o.b. Cleveland	2.85c.
Del'd Chicago	3.13c.
F.o.b. Worcester	3.05c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

		Pittsburgh and Cleveland	Worcester
Carbon	0.25-0.50%	2.85c.	3.05c.
Carbon	.51- .75	3.95c.	4.15c.
Carbon	.76-1.00	5.70c.	5.90c.
Carbon	Over 1.00	7.75c.	7.95c.

Fender Stock

No. 14, Pittsb'gh or Cleveland	3.10c.
No. 14, Worcester	3.50c.
No. 20, Pittsb'gh or Cleveland	3.50c.
No. 20, Worcester	3.90c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Spring wire	3.20c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.50
Smooth coated nails	2.50
	Base per 100 Lb.
Annealed fence wire	$2.90
Galvanized fence wire	3.30
Polished staples	3.20
Galvanized staples	3.45
Barbed wire, galvanized	3.05
Twisted barbless wire	3.05
Woven wire fence, base column	67.00
Single loop bale ties, base column	58.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	.57	37	⅛ & ¼	+6	+26
⅛ to ⅜	.60	44½	½	27	10½
½	64½	55	¾	32	16
¾	67½	59	1 & 1¼	35	21
1 to 3	69½	61½	1½	39	23½
			2	38½	23

Lap Weld

2	62	53½	2	32½	18
2½ to 3.65		56½	2½ to 3½	33½	20½
3½ to 6.67		58½	4 to 8	35½	24
7 & 8.66		56½	9 to 12	28½	15
9 & 10.65		56			
11 & 12.64		55			

Butt Weld, extra strong, plain ends

⅛	55½	42½	¼ & ⅜	+7	+39
¼ to ⅜	57½	46½	½	28	13
½	62½	54½	¾	33	18
¾	66½	58½	1 to 2	39	24½
1 to 3	68	61			

Lap Weld, extra strong, plain ends

2	60	52½	2	35½	21½
2½ to 3.64		56½	2½ to 4.41		28½
3½ to 6.67		60	4½ to 6.40		28½
7 & 8	66½	57	7 & 8	41½	28½
9 & 10	65½	56	9 to 12	32	20½
11 & 12	64½	55			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$ 7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	17.61	16.01
2½ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	$21.45	$19.50
3½ in. o.d.	10 B.W.G.	41.08	37.35
3½ in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

Extra for less-carload quantities:

25,000 lb. or ft. to	39,999 lb. or ft.	5	%
12,000 lb. or ft. to	24,999 lb. or ft.	12½	%
6,000 lb. or ft. to	11,999 lb. or ft.	25	%
2,000 lb. or ft. to	5,999 lb. or ft.	35	%
Under 2,000 lb. or ft.		50	%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$50.00
6-in. and larger, del'd New York	48.00
*6-in. and larger, Birmingham	42.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	50.50
F.o.b. dock, Seattle	50.50
4-in., f.o.b. dock, San Francisco or Los Angeles	53.50
F.o.b. dock, Seattle	53.50

Class "A" and gas pipe, $3 extra. 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $41, Birmingham, and $49.50, delivered Chicago; and 4-in. pipe, $44, Birmingham, and $52.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. x 6 in. and smaller	70
Larger than ½ in.	65 and 10
Lag bolts	65 and 10
Plow bolts, Nos. 1, 2, 3, and 7 heads	65, 10 and 10
Hot-pressed nuts, blank or tapped, square	65 and 10
Hot-pressed nuts, blank or tapped, hexagon	65 and 10
C.p.c and t, square or hex. nuts, blank or tapped	65 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes	60, 20 and 5
Stove bolts in packages, nuts attached	72½
Stove bolts in packages, with nuts separate	72½ and 5
Stove bolts in bulk	81½

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.25
F.o.b. Chicago or Birmingham	3.35

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70
F.o.b. Cleveland	70
F.o.b. Chicago and Birmingham	70

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.

Base price, $55 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.75c.
Delivered, Detroit	2.90c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (1½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.10c.
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric turned steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.25c. base per lb. Delivered Detroit, 3.40c.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets		19.55c.
Bars	24c.	23c.
Plates	28c.	26c.
Structural shapes		23c.
Sheets	35c.	33c.
Hot-rolled strip	22¾c.	20¾c.
Cold-rolled strip	29c.	27c.
Drawn wire		23c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	17c.	18½c.	21c.	26c.
Plates	20c.	21½c.	24c.	29c.
Sheets	25c.	28c.	31c.	35c.
Hot strip	15¾c.	16¾c.	21¾c.	26¾c.
Cold stp.	20½c.	22c.	27c.	35c.

TOOL STEEL

	Base Per Lb.
High speed	60c.
High carbon chrome	39c.
Oil hardening	22c.
Special	20c.
Extra	16½c.
Regular	13c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	£10	7s. 6d.
Billets, open-hearth	£7 7s. 6d. to	£7 12s. 6d.
Tin plate, per base box	£2	19s.
Steel bars, open-hearth	£8	10s.
Beams, open-hearth	£9	12s. 6d.
Channels, open-hearth	£9	17s. 6d.
Angles, open-hearth	£9	12s. 6d.
Black sheets, No. 24 gage	£13	14½s. 6d.
Galvanized sheets, No. 24 gage	£16	4½s. 6d.

CONTINENTAL

Per Metric Ton, Gold £, f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£3	4s. 6d.
Wire rods, No. 5 B.W.G.	£4	10s.
Steel bars, merchant	£3	15s. 6d.
Sheet bars	£2	15s. 6d.
Plate, ¼ in. and up	£6	14s.
Plate, 3/16 in. and 5 mm.	£5	
Sheet, ⅛ in.	£6	5s.
Beams, Thomas	£3	2s. 6d.
Angles (Basic)	£3	2s. 6d.
Hoops and strip, base	£4	
Wire, plain, No. 8	£5	7s. 6d.
Wire nails	£5	15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8	15s.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	Base per Lb.
Plates	3.40c.
Structural shapes	3.40c.
Soft steel bars and small shapes	3.30c.
Reinforcing steel bars	3.30c.
Cold-finished and screw stock:	
Rounds and hexagons	3.80c.
Squares and flats	3.80c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	3.50c.
Hoops	4.00c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.15c.
Galv. sheets (No. 24), 10 or more bundles	4.75c.
Hot-rolled sheets (No. 10)	3.50c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.94
Spikes, large	3.50c.
	Per Cent Off List
Track bolts, all sizes, per 100 count	60
Machine bolts, 100 count	65-5
Carriage bolts, 100 count	65-5
Nuts, all styles, 100 count	65-5
Large rivets, base per 100 lb.	$3.75
Wire, black, soft ann'l'd, base per 100 lb.	3.15c.
Wire, galv. soft, base per 100 lb.	3.55c.
Common wire nails, per keg	2.50c.
Cement coated nails, per keg.	2.50c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

•Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.45c.
Soft steel bars, rounds	3.35c.
Soft steel bars, squares and hexagons	3.50c.
Cold-fin. steel bars:	
Rounds and hexagons	3.95c.
Flats and squares	3.95c.
Hot-rolled strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	4.85c.
Spikes (keg lots)	4.00c.
Track bolts (keg lots)	5.10c.
Rivets, structural (keg lots)	4.10c.
Rivets, boiler (keg lots)	4.20c.
	Per Cent Off List
Machine bolts	•65
Carriage bolts	•65
Lag screws	•65
Hot-pressed nuts, sq. tap or blank	•65
Hot-pressed nuts, hex. tap or blank	•65
Hex. head cap screws	60
Cut point set screws	75 and 10
Flat head bright wood screws	62 and 20
Spring cotters	55
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade	$4.05
Com. wire nails, 15 kegs or more	2.70c.
Cement c't'd nails, 15 kegs or more	2.70c.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants wihtin the Chicago switching district.

•These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.65c.
Structural shapes	3.62c.
Soft steel bars, rounds	3.62c.
Iron bars, Swed. charcoal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.22c.
Flats and squares	4.22c.
Cold-rolled; strip, soft and quarter hard	3.57c.
Hoops	3.82c.
Bands	3.82c.
Hot-rolled sheets (No. 10)	3.82c.
Hot-rolled ann'l'd sheets (No. 24*)	4.47c.
Galvanized sheets (No. 24*)	5.07c.
Long terne sheets (No. 24)	5.80c.
Armco iron, galv. (No. 24†)	5.85c.
Toncan iron, galv. (No. 24†)	5.85c.
Galvannealed (No. 24†)	6.20c.
Armco iron, hot-rolled annealed (No. 24†)	5.30c.
Toncan iron, hot-rolled annealed (No. 24†)	5.30c.
Armco iron hot-rolled (No. 10†)	4.35c.
Toncan iron, hot-rolled (No. 10†)	4.35c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	
Standard quality	5.10c.
Deep drawing	5.75c.
Stretcher leveled	5.75c.
SAE, 2300, hot-rolled	7.32c.
SAE, 3100, hot-rolled	5.72c.
SAE, 6100 hot-rolled, annealed	9.92c.
SAE, 2300, cold-rolled	8.30c.
SAE, 3100, cold-rolled, annealed	7.75c.
Floor plate, ⅛ in. and heavier	5.45c.
Standard tool steel	11.75c.
Wire, black, annealed (No. 9)	3.60c.
Wire, galv. (No. 9)	3.85c.
Tire steel, 1 x ½ in. and larger	4.11c.
Open-hearth spring steel	4.15c. to 10.15c.
Common wire nails, base per keg	$3.70
	Per Cent Off List
Machine bolts, square head and nut:	
All diameters	65
Carriage bolts, cut thread:	
All diameters	65

• No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.
† 125 lb. and more.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.69c.
Bars, soft steel (rounds and flats)	3.59c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.74c.
Cold-fin. rounds, shafting, screw stock	4.19c.
Hot-rolled annealed sheets (No. 24)	4.29c.
Galv. sheets (No. 24)	4.89c.
Hot-rolled sheets (No. 10)	3.59c.
Black corrug. sheets (No. 24)	4.29c.
½ Galv. corrug. sheets	4.89c.
Structural rivets	4.44c.
Boiler rivets	4.44c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

•No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
•Plates, ¼-in. and heavier	3.30c.
•Structural shapes	3.30c.
•Soft steel bars, small shapes, iron bars (except bands)	3.45c.
‡Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.18c.
•Steel hoops	3.80c.
•Steel bands, No. 12 and 3/16 in. incl.	3.55c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	4.15c.
†Galvanized sheets (No. 24)	4.80c.
•Hot-rolled annealed sheets (No. 10)	3.40c.
Diam. pat. floor plates, ¼ in.	5.25c.
Swedish iron bars	6.25c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

•Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.56c.
Soft steel bars	3.25c.
‡Reinforc. steel bars	2.25c.
†Cold-finished steel bars	3.95c.
Flat-rolled steel under ¼ in.	3.66c.
Cold-finished strip	†3.25c.
Hot-rolled annealed sheets (No. 24)	4.31c.
Galvanized sheets (No. 24)	4.91c.
Hot-rolled sheets (No. 10)	3.41c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.66c.
•Black ann'l'd wire, per 100 lb.	$3.10
•No. 9 galv. wire, per 100 lb.	3.50
•Com. wire nails, base per keg.	2.70c.
	Per Cent Off List
Machine and carriage bolts, small	70
Large	65 and 10
Nuts, 100 count	65

†Outside delivery 10c. less.
•For 5000 lb. or less.
‡Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.65c.
Floor plates	5.40c.
Bars, rounds, flats and angles.	3.55c.
Other shapes	3.70c.
Rail steel reinforc. bars	3.40c.
Hoops and bands, 3/16 in. and lighter	3.75c.
Cold-finished bars	4.15c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.05c.
Galv. sheets (No. 24) 3750 lb. or more	4.07c.
Galvanized sheets (No. 24) over 3500 lb.	4.65c.
Hot-rolled sheets (No. 10)	3.50c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload.	3.04
Cement c't'd nails, base 100-lb keg	3.50
Chain. lin. per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.3[illegible]
4-in.	45.32

BUFFALO

	Base per Lb
Plates	3.62c.
Struc. shapes	3.50c.
Soft steel bars	3.40c.
Reinforcing bars	2.75c.
Cold-fin. flats and sq.	4.00c.
Rounds and hex.	4.00c.
Cold-rolled strip steel	3.44c.
Hot-rolled annealed sheets (No. 24)	4.65c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.72c.
Galv. sheet (No. 24)	5.05c.
Bands	3.72c.
Hoops	3.72c.
Heavy hot-rolled sheets	3.47c.
Com. wire nails, base per keg.	$3.00
Black wire, base per 100 lb. (2500-lb. lots or under)	3.95c.
(Over 2500 lb.)	3.85c.

BOSTON

	Base per Lb
Channels, angles	3.75c.
Tees and zees, under 3"	4.00c.
H beams and shapes	3.77c.
Plates — Sheared, tank, and univ. mill, ¼ in. thick and heavier	3.78c.
Floor plates, diamond pattern	5.58c.
Bar and bar shapes (mild steel)	3.75c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.90c. to 4.90c.
Half rounds, half ovals, ovals and bevels	5.00c.
Tire steel	5.00c.
Cold-rolled strip steel	3.495c.
Cold-finished rounds, squares and hexagons	4.30c.
Cold-finished flats	4.30c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.44c.
Structural shapes	3.65c.
Plates	3.65c.
Floor plates	5.40c.
Hot-rolled annealed sheets (No. 24)*	4.34c.
Hot-rolled sheets (No. 10)	3.44c.
Galvanized sheets (No. 24)**	5.00c.
Bands and hoops	3.69c.
†Cold-finished bars	4.04c.
Cold-rolled strip	3.43c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.79c.

Bolts and nuts, in cases, 65 per cent off list
Broken cases .....60 per cent off

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

* Under 400 lb., .50c. over base; 400 to 3499 lb., base; 3500 lb. and over, base less .25c.

** Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3749 lb., base less .20c.; 3750 to 7499 lb., less .40c.; 7500 lb. and over, less .60c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Common wire nails, base per keg $2.75

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.56c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.46c.
Soft steel bars, squares and hexagons	3.61c.
Hot-rolled strip	3.71c.
Hot-rolled annealed sheets (No. 24)	4.36c.
Galvanized sheets (No. 24)	4.96c.
Cold-finished steel bars	4.06c.
Structural rivets (keg lots)	4.31c.
Boiler rivets, cone head (keg lots)	4.31c.
Track spikes (keg lots)	4.21c.
Track bolts (keg lots)	5.31c.
Black annealed wire (No. 14 and heavier)	3.60c.
Com. wire nails and cement coated nails 1 to 14 kegs	2.75c.

	Per Cent Off List
Machine bolts and carriage bolts, ½x6 and smaller	65-10
Larger	65
Coach and lag screws	65
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	65

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.60c.
Structural shapes	3.70c.
Plates	3.70c.
Cold-finished bars	4.20c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	5.10c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	3.50c.
Structural shapes	3.60c.
Reinforcing bars	....prices on application
Plates	3.60c.
Hot-rolled sheets, No. 10	3.45c.
Bands	3.50c.
Hoops	3.75c.
Special threading steel	3.60c.
Diamond pattern floor plates ¼ in. and heavier	5.60c.
Galvanized bars, bands and small shapes	6.00c.
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	4.15c.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.71c.
Iron bars	3.71c.
Reinforcing bars	3.71c.
Structural shapes	3.81c.
Plates	3.81c.
Hot-rolled sheets No. 10	3.66c.
Hot-rolled annealed sheets, No. 24*	3.56c.
Galvanized sheets No. 24*	4.16c.
Steel bands	3.91c.
Cold-finished bars	4.51c.

* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	3.81c.
Shapes, bar size	3.81c.
Iron bars	3.81c.
Structural shapes	3.91c.
Plates	3.91c.
Hot-rolled sheets, No. 10	3.76c.
Hot-rolled annealed sheets, No. 24	4.66c.
Galvanized sheets, No. 24	5.26c.
Steel bands	4.01c.
Cold-drawn rounds	4.45c.
Cold-drawn flats, squares, hexagons	6.45c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	60
Small rivets, per cent off list	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.70c.
Reinforcing bars	3.50c.
Structural shapes	3.80c.
Plates	3.80c.
Hot-rolled sheets, No. 10	3.85c.
Hot-rolled annealed sheets, No. 24	4.55c.
Galvanized sheets, No. 24	5.10c.
Steel bands	4.25c.
Cold-finished steel bars	4.75c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$2.80
Bolts and nuts, per cent off list	70-10

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.75c.	4.00c.	3.95c.
Shapes, standard	3.75c.	4.00c.	3.95c.
Soft steel bars	3.85c.	4.00c.	4.10c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.725c.	2.725c.	3.725c.
Hot-rolled annealed sheets (No. 24)	4.65c.	4.60c.	4.85c.
Hot-rolled sheets (No. 10)	3.95c.	4.15c.	4.10c.
Galv. sheets (No. 24 and lighter)	5.25c.	5.05c.	5.35c.
Galv. sheets (No. 22 and heavier)	5.50c.	5.20c.	5.35c.
Cold finished steel			
Rounds	6.30c.	6.35c.	6.60c.
Squares and hexagons	7.55c.	7.60c.	6.60c.
Flats	8.05c.	8.10c.	7.60c.
Common wire nails—base per keg less carload	$3.10	$3.05	$3.10

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$48.00
High-heat duty, New Jersey	58.00
High-heat duty, Ohio	43.00
Intermediate, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	43.00
Intermediate, New Jersey	46.00
No. 1, Ohio	40.00
Ground fire clay, per ton	7.00

5 per cent trade discount on fire clay brick.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$48.00
Chicago District	57.00
Birmingham	48.00
Silica cement per net ton	8.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester, Pa.	$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	42.00
Domestic, f.o.b. Chewelah, Wash.	24.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$23.75
F.o.b. Bethlehem, Birdsboro, and Swedeland, Pa., and Sparrows Point, Md.	23.00
Delivered Brooklyn	25.27
Delivered Newark or Jersey City	24.39
Delivered Philadelphia	23.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	22.00
F.o.b. Jackson, Ohio	23.75
Delivered Cincinnati	22.07
F.o.b. Duluth	22.50
F.o.b. Provo, Utah	21.00
Delivered San Francisco, Los Angeles or Seattle	23.00
F.o.b. Birmingham*	18.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of .70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	$23.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	22.50
F.o.b. Buffalo	21.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill	21.50
Delivered Cincinnati	22.01
Delivered Canton, Ohio	22.76
Delivered Mansfield, Ohio	23.26
F.o.b. Jackson, Ohio	23.25
F.o.b. Provo, Utah	20.50
F.o.b. Birmingham	17.00

Bessemer

F.o.b. Everett, Mass.	$24.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	24.00
Delivered Boston Switching District	24.50
Delivered Newark or Jersey City	25.39
Delivered Philadelphia	24.76
F.o.b. Buffalo and Erie, Pa., and Duluth	23.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	22.50
F.o.b. Birmingham	23.50
Delivered Cincinnati	23.51
Delivered Canton, Ohio	23.76
Delivered Mansfield, Ohio	24.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$24.50
Delivered Chicago	27.54

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.25	20.50
Malleable	21.00
Basic	20.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 6.00 to 6.50%	$26.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	$31.50
10.51 to 11.00%	32.00
11.01 to 11.50%	32.50
11.51 to 12.00%	33.00
12.01 to 12.50%	33.50
12.51 to 13.00%	34.00
13.01 to 13.50%	34.50
13.51 to 14.00%	35.00
14.01 to 14.50%	35.50
14.51 to 15.00%	36.00
15.01 to 15.50%	36.50
15.51 to 16.00%	37.00
16.01 to 16.50%	37.50
16.51 to 17.00%	38.00

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.30
Ferrotungsten, lots of 5000 lb.	1.35
Ferrotungsten, smaller lots	1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	$2.50
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnaee carload and contract per net ton	$137.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	$38.00
Ton lots or less, per ton	43.00
Silico-manganese, gross ton, delivered.	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00

Note: Spot prices are $5 a ton higher except on 75 per cent ferrosilicon on which premium is $10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$4.80
Old range, non-Bessemer, 51.50%	4.65
Mesabi, Bessemer, 51.50%	4.65
Mesabi, non-Bessemer, 51.50%	4.50
High phosphorus, 51.50%	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	13.50c.
Iron, low phos., Swedish, average, 68½% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	10.00c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	34c.
Man., African, Indian, 44-48%	25c to 30c.
Man., African, Indian, 49-51%	30c.
Man., Brazilian, 46 to 48½%	Nominal..25c. to 30c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	$15.25 to $15.50
Tungsten, domestic, scheelite delivered, nominal	15.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per net ton:	
South African	$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	25.00
Turkish, 48-49%	22.00 to $22.50
Turkish, 45-46%	20.00 to 20.50
Turkish, 44%	18.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
52%	$25.00 to $25.50
50%	24.00
48-49%	22.00 to 22.50

FLUORSPAR *Per Net Ton*

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
Domestic, barge and rail	18.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL *Per Gal*

F.o.b. Bayonne or Baltimore No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	4.25c.
Del'd Ch'go, No. 5 industrial	3.90c.
Del'd Cleve'd, No. 3 distillate	6.00c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke *Per Net Ton*

Furnace, f.o.b. Connellsville, Prompt	$4.25 to $4.35
Foundry, f.o.b. Connellsville, Prompt	4.50 to 5.80
Foundry, by-product, Chicago ovens	9.00
Foundry, by-product, del'd New England	12.00
Foundry, by-product, del'd Newark or Jersey City	9.60 to 10.05
Foundry, by-product, Philadelphia	9.85
Foundry, by-product, delivered Cleveland	10.25
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.76

Coal *Per Net Ton*

Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

NIAGARA FALLS, N.Y.

Sales Offices: NEW YORK—30 Church St. • PITTSBURGH—Oliver Bldg. • CLEVELAND—Hanna Bldg.

FABRICATED STEEL

. . . Lettings in small volume at 10,700 tons compared with 12,350 tons last week.

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. . . New projects advance to 15,100 tons as against 8880 tons in the previous week.

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. . . Plate awards call for 1845 tons.

STRUCTURAL AWARDS

NORTH ATLANTIC STATES

Manchester, N. H., 1000 tons, MacGregor bridge, to American Bridge Co.

Lyme, N. H., 450 tons, State bridge, to American Bridge Co.

Thetford, Vt., 475 tons, bridge over Connecticut River, to American Bridge Co.

New York, 475 tons, Columbia University building, to Harris Structural Steel Co., Plainfield, N. J.

New York, 440 tons, Washburn Wire Co. building, to Fort Pitt Bridge Works Co., Pittsburgh.

New York, 250 tons, Coast Guard station F, to Harris Structural Steel Co.

Brooklyn, 130 tons, Firestone Rubber Co. warehouse, to Ingalls Iron Works Co., Birmingham.

Brooklyn, 210 tons, Holy Family hospital, to Harris Structural Steel Co.

New Rochelle, N. Y., 105 tons, post office, to Bethlehem Steel Co.

West Orange, N. J., 740 tons, armory, to Oltmer Iron Works, Jersey City.

North Bergen, N. J., 155 tons, railroad bridge, to Phoenix Bridge Co., Phoenixville, Pa.

Kearny, N. J., 820 tons, Coca-Cola factory, to Lehigh Structural Steel Co., Allentown, Pa.

Pittsburgh, 165 tons, P-K Construction Co. building, to Keystone Engineering Co., Pittsburgh.

Harrisburg, Pa., 100 tons, hospital, to Richard de Cou Co., Philadelphia.

Lebanon, Pa., 250 tons, Lebanon Paper Box Co., to Lehigh Structural Steel Co.

SOUTH AND SOUTHWEST

Berclair, Tenn., 830 tons, transmission towers, Pickwick-Memphis line, TVA, to American Bridge Co.

Morgan County, W. Va., 270 tons, highway bridge, to Roanoke Iron & Bridge Co.

Lumpkin County, Ga., 125 tons, highway bridge, to Virginia Bridge Co.

Live Oak, Tex., 295 tons, bridge, to Austin Brothers, Dallas, Tex.

Comanche County, Okla., 165 tons, bridge, to Capitol Steel & Iron Co., Oklahoma City.

CENTRAL STATES

Detroit, 275 tons, Packard Motor Co. building, to Whitehead & Kales Co., Detroit.

Two Harbors, Minn., 125 tons, highway bridge, to Illinois Steel Bridge Co., Jackson, Ill.

Milwaukee, 395 tons, Klug & Smith building addition, to Worden-Allen Co., Milwaukee.

St. Louis, 125 tons, Seven-Up Bottling Co. building, to LaSalle Iron Works, St. Louis.

Hammond, Ind., 600 tons, transmission towers, Northern Indiana Public Service Co., to Bethlehem Steel Co.

Peoria, Ill., 620 tons, post office, to Bethlehem Steel Co.

WESTERN STATES

Palisade, Colo., 250 tons, highway bridge, to Midwest Steel & Iron Works Co., Denver.

Knop, Cal., 400 tons, highway bridges over All-American Canal, to Milwaukee Bridge Co., Milwaukee.

Los Angeles, 445 tons, Alameda Street bridge, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

West Point, N. Y., 2000 tons, armory.

Poughkeepsie, N. Y., 250 tons, Western Printing & Lithographing Co. building.

Massena, N. Y., 750 tons, pot shells and frames, Aluminum Co. of America.

Lebanon, Pa., 250 tons, factory addition, Lebanon Paper Box Co.

Avonmore, Pa., 400 tons, State bridge, route 739.

Westmoreland-Armstrong County, Pa., 400 tons, highway work; bids March 5.

Baltimore, 200 tons, Coast Guard building, Curtis Bay, for Treasury Department.

THE SOUTH

Alcoa, Tenn., 1500 tons, pot shells and frames, Aluminum Co. of America.

State of Tennessee, 1238 tons, highway bridges.

State of Texas, 1825 tons, highway bridges.

CENTRAL STATES

Dearborn, Mich., 1500 tons, bridge.

Dearborn, Mich., 3000 tons, tire plant, Ford Motor Co.

Richmond, Ind., 1200 tons, mill building for Wayne Works.

Cleveland, 110 tons, building for Reliance Electric & Engineering Co.

Cleveland, 100 tons, extensions telephone exchange building for Ohio Bell Telephone Co.

Clinton, Iowa, 600 tons, Mississippi River bridge and approaches.

WESTERN STATES

Polson, Mont., 300 tons, power house, Rocky Mountain Power Corp.

State of Colorado, 600 tons, bridges.

Newark, Cal., 600 tons, plant for West-Vaco Chlorine Products Corp.; H. K. Ferguson Co., general contractor.

Sacramento, Cal., 5000 tons, Air Corps engineering shop and repair dock at Sacramento air port; MacDonald & Kahn Co., Ltd., general contractor.

Matanuska, Alaska, 250 tons, bridge for Department of Interior, for Alaska Railroad.

FABRICATED PLATES

AWARDS

Flint, Mich., 750 tons, water main, to Youngstown Sheet & Tube Co.

Vicksburg, Miss., 195 tons, derrick barge for United States Engineers, to St. Louis Shipbuilding & Steel Co.

Newark, Cal., 900 tons, plant for West-Vaco Chlorine Products Co., to Western Pipe & Steel Co., San Francisco.

SHEET PILING

AWARDS

Tuscaloosa, Ala., 2100 tons, lock and dam, to Carnegie-Illinois Steel Corp.

Republic, Gulf States Merger Approved

MARCH 2.—The Board of Directors of Republic Steel Corp. and Gulf States Steel Co. today approved a contract providing for the sale to Republic of all the properties and assets of Gulf States Steel in consideration of the issue to Gulf States of common stock of Republic in the ratio of 2 1/3 shares of such stock of Republic for each one share of Gulf States common stock outstanding at the date of the consummation of the sale. In consideration, Republic will assume the outstanding first (closed) mortgage sinking fund 4½ per cent bonds and other indebtedness.

A meeting of the stockholders of Gulf will shortly be called to vote on the transaction. To make the sale effective, a favorable vote by holders of a majority of the outstanding common stock of Gulf will be necessary. No action of Republic stockholders is required. If the necessary number of Gulf stockholders approve this sale, it will be immediately consummated, and the Republic common stock received by Gulf will be distributed to Gulf stockholders and the Gulf company will be dissolved.

THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . Automobile companies issue inquiries for work on 1938 models.

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. . . Business generally is in fairly good volume.

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. . . Cincinnati district working out of flood difficulties.

Detroit

ALTHOUGH there is still a dearth of machine tool orders, the last week has seen the largest number of inquiries issued by automobile plants in many a month, as a number of companies get started on program work for 1938 cars. Several companies are getting proposals together on equipment to increase cylinder block production, including Plymouth and Chrysler, although the real hot spot in the Chrysler picture is Windsor, Ont., where plans are afoot to install a composite line for machining Plymouth and Dodge blocks completely from the rough casting, in line with the Canadian Government's restriction on the percentage of parts to be made in Canada. Cadillac has some changes in mind on the V-16 cylinder engine block and is lining up the necessary equipment to produce it. Figures are also being taken on equipment to manufacture a truck Diesel engine at the Cadillac plant. Buick is figuring on some rear axle changes in connection with the automatic transmission for which equipment has been purchased.

Cincinnati

MACHINERY business is fairly brisk in this area. Ordering covers the whole field of types, although multiple unit orders are not reported. Heavy tools are in good demand. Flood problems still are disturbing from the production point of view. Castings requirements are still in jeopardy through inability of foundries to rehabilitate to such a point as will insure sufficient capacity to supply needs. Most plants dependent upon melters in the flood zone are using inventories, but in some instances operations are rescheduled because of lack of castings. The destruction of patterns by high water is a second problem which is now appraised as likely to be bothersome throughout the year. Urgent pattern needs have been supplied or are in the process, but the remainder is being postponed until need arises. Production is also being retarded by a lack of sufficient skilled labor. Many factories report definite need for more capable machinists, but efforts to obtain them have been unavailing.

Pittsburgh

BUSINESS in February compares favorably with that booked in the first month of the year. The rate of activity was not as high as that experienced last December, but has been progressing on a more or less normal basis. It is expected that this same steady volume of transactions will take place during March as there is no evidence of any drastic falling off in either orders or inquiries. Inquiries in the past week have been in slightly better volume with no individual tool being outstanding. Aggregate orders during the closing weeks of February showed a slight improvement over those received at the beginning of the month. The delivery situation remains unchanged.

Cleveland

ORDERS for machine tools have shown a moderate improvement since the settlement of the General Motors strike. Demand is mostly for single or at the most two machines. The total volume of business in February compares favorably with January. Republic Steel Corp. is inquiring for 16-in., 18-in. and 36-in. lathes, a grinder, milling machine, shaper and a pipe machine for its Corrigan-McKinney works in Cleveland. Toledo took bids March 2 for four or five machines and inquiries are pending from the Deming Co., Salem, Ohio, and the Byers Machine Co., Ravenna, Ohio, each for three machines.

New York

THE market continues active, and deliveries have shown no improvement. Railroads appear to be interested in tools, but only in a minor way thus far. The chief occupation of sellers is in trying to satisfy the demand from consumers for quicker shipments. Wage increases are being granted in some machine tool builders' plants, and, if costs continue to ascend, further price advances are not unlikely.

Chicago

DEALERS are reporting that quick turns of political minds are giving some machine tool buyers cases of nerves, with resultant checks on some purchases. However, as a whole, business remains good. Dollar value of orders in February approximated the January total and fresh inquiries hold much promise. The automobile industry, looking closely at deliveries, is making unusually early plans for new model tooling. Allis Chalmers Mfg. Co. is still debating the subject of a plant addition. Nash Motors Co. is in the market in a small way and it may expand its needs. Railroad business is limited to the clean-up of the Santa Fe and the Milwaukee Road lists.

McKee to Build British Steel Plant

ARTHUR G. McKEE & CO., Cleveland, has received a contract from Appleby-Frodingham Steel Co., Ltd., of Scunthorpe, Lincolnshire, England, for the design and construction of a new plant to be located adjacent to its present blast furnace and steel works at Scunthorpe. Appleby-Frodingham Steel Co., Ltd., is a constituent of United Steel Companies, Ltd., of Great Britain.

The new plant will consist of two modern blast furnaces with complete auxiliary equipment, and including plants for ore crushing and sintering ore. The plant will operate on local Lincolnshire and Northamptonshire ores, which may be supplemented by foreign ores. A modern coke oven and by-products plant will be included, although the latter is not to be provided by McKee. Preparation of designs and specifications will be done at the firm's headquarters in Cleveland.

Capacity of the two furnaces, if operated on American ores, would be about 1200 tons daily, but will be somewhat less when operated on English ores of lower iron content.

It is expected that the plant can be completed in about 15 months.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

National Container Corp., Review and Borden Avenues, Long Island City, manufacturer of corrugated shipping boxes and containers, has arranged with City Council, Jacksonville, Fla., for acquisition of former plant of American Agricultural Chemical Co. and adjoining land, now held by municipality, as site for new pulp and paper board mill. Existing buildings will be remodeled and new units erected. Plant will have initial capacity of 200 tons of pulp and paper board products per day, with output to be shipped to converting plant at first noted address. Cost over $2,500,000 with machinery. Work will begin early in spring. Company is securing leases of timber lands for raw material supply, with construction of saw mills, shops and other structures, and installation of mechanical-handling and loading equipment.

Kirkham Engineering & Mfg. Co., Farmingdale, L. I., has purchased former plant of Indestructo Glass Works, Amityville Road, comprising about 15 acres with one-story building of 50,000 sq. ft. floor space, and will remodel for manufacture of airplane parts and kindred products.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 9 for 30,000 jack-knives (Schedule 73); until March 16 for 1075 cylinder regulators (Schedule 74), pressure gages and compound gases (Schedule 91).

Sicilian Asphalt Paving Co., 41 Park Row, New York, plans expansion in works at Paidge Avenue and Brant Street, Brooklyn, including additional equipment in mixing, storage and distribution and other departments. Cost over $100,000.

Robinson Wagner Co., Inc., 98 Front Street, Brooklyn, manufacturer of industrial chemicals, etc., has leased a two-story and basement building, 14,000 sq. ft. floor space, at 129 Fifty-first Street, and will remodel for plant.

National Adhesives Corp., 820 Greenwich Street, New York, manufacturer of glues and other adhesive products, dextrines, etc., has asked bids on general contract for new two-story plant, 110 x 200 ft., at Thirty-sixth Street and Washtenaw Avenue, Chicago. Cost about $170,000 with equipment. Wigton-Abbott Corp., 143 Liberty Street, New York, is engineer.

United States Engineer Office, First District, New York, asks bids until March 8 for one clamshell bucket (Circular 192).

General Bronze Corp., 34-19 Tenth Street, Long Island City, manufacturer of ornamental bronze and wrought iron, architectural bronze products, etc., has acquired adjoining tract, 100 x 150 ft., for addition, to be erected later.

Schenley Distillers Corp., 20 West Fortieth Street, New York, has acquired Bernheim Distilling Co., Seventeenth and Breckenridge Streets, Louisville, and its subsidiary, Belmont Distilling Co., same address, and will operate as units of organization. Purchasing company plans erection of mechanical-bottling works, with expansion in other departments.

Construction Quartermaster, United States Military Academy, West Point, N. Y., asks bids until March 16 for equipment storage and distributing building, coal-storage building, and automobile service and garage building. Cost about $415,000 with equipment.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until March 8 for one pressure reducing and desuperating equipment (Circular 594); until March 10, for reworking 29,000 lb. time fuze rings and forgings into brass rods (Circular 602).

Sun Shipbuilding & Dry Dock Co., Chester, Pa., plans one-story additions to mechanical shops. Cost about $50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 9 for one motor-driven pipe-threading machine (Schedule 63); until March 12, 800 aircraft airspeed indicators (Schedule 58), 500 aircraft turn and bank indicators (Schedule 56).

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 9 for seven motor-driven surface grinding machines (Circular 456).

NEW ENGLAND

E. Ingraham Co., North Main Street, Bristol, Conn., manufacturer of clocks and clock mechanisms, has let general contract to Torrington Building Co., Torrington, Conn., for new four-story structure and one-story top addition to present one-story unit. Cost over $80,000 with equipment. Company also has let contract to H. Wales Lines Co., Meriden, Conn., for two-story addition to office building. Perry & Bishop, New Britain, Conn., are architects.

Commanding Officer, Ordnance Depot, Watertown Arsenal, Watertown, Mass., asks bids until March 17 for one radial drill (Proposal 352), one multi-tool turning lathe (Proposal 353).

School Board, Administration Building, Springfield, Mass., John Granrud, superintendent, has preliminary plans for new multi-story trade school in Blunt Park district. Cost about $900,000 with equipment. Frank W. S. King, 33 Lyman Street, is architect.

Argonne Worsted Co., Hamlet Avenue, Woonsocket, R. I., plans one-story steam power house. Cost close to $50,000 with equipment.

Property and Disbursing Officer, National Guard Bureau, Concord, N. H., asks bids until March 22 for two 7½-ton hydraulic jacks, one air compressor, one pneumatic hammer, one automobile and truck electric test bench, valve reseater and other equipment.

BUFFALO DISTRICT

Bliss & Laughlin, Inc., Hopkins and Colgate Streets, Buffalo, manufacturer of steel shafting and kindred steel products, has let general contract to John W. Cowper Co., Inc., Sidway Building, for one-story addition. Cost close to $125,000 with equipment. Structural steel has been let to Lackawanna Steel Construction Corp., Buffalo.

United States Engineer Office, Federal Building, Buffalo, asks bids until March 8 for one motor-driven heavy-duty woodworking machine complete (Schedule 74), 10,000 ft. phosphor bronze wire rope (Circular 75).

Trico Products Corp., 817 Washington Street, Buffalo, automobile equipment, has taken out building permit for six-story addition, 100 x 265 ft., with part of unit, 100 x 180 ft. Cost about $500,000 with equipment, instead of smaller amount previously noted in these columns. W. R. Jewell, 33 Frontenac Avenue, is architect.

WASHINGTON DIST.

Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until March 24 for one 48-in. suspended type centrifuge (Circular 115).

Chesapeake & Ohio Railroad Co., Richmond, Va., plans addition to coal-storage and distribution yards and dock at Presque Isle, Toledo, Ohio, including conveying, elevating, loading and other mechanical-handling equipment. Storage and loading facilities will be increased about 25 per cent. Cost close to $500,000 with machinery.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 10 for high-speed steel twist drills, carbon steel twist drills, bolt dies, split dies, hand taps, bridge reamers, bench vises, pipe vises, pipe wrenches, monkey wrenches, wood rip saws, assorted files, welders' goggles, hand shovels, spades, scythe blades and other equipment (Schedule 3228).

Bureau of Yards and Docks, Navy Department, Washington, asks bids until March 17 for gasoline engine-driven electric generator set, elevated steel water tank and tower, boiler plant equipment, wire fencing, water and steam distributing systems and other equipment for Naval Radio Station, Cheltenham, Md. (Specifications 8152).

Contracting Officer, Quartermaster Corps, Fort Monroe, Va., asks bids until March 9 for anchor chains, ¾-in. links, and four shackles (Proposal 570-47).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 9 for one engine lathe and ammeter (Schedule 61), two turret lathes (Schedule 62), two floor-type grinders, all motor-driven (Schedule 69), for Norfolk, Va., Navy Yard; 40 oxygen cylinders, complete with valve, etc. (Schedule 27) for Quantico, Va., Station; until March 12, seamless steel flasks (Schedule 31), corrosion-resisting steel tubing (Schedule 35) for Portsmouth and Mare Island yards; low-tension electric cable (Schedule 44); until March 16, fillers and oilers (Schedule 52) for Eastern and Western yards; copper-nickel alloy forgings (Schedule 5) for Washington yard; 47 metal litters (Schedule 89) for Sewall's Point and Mare Island yards.

SOUTH ATLANTIC

Walker Electric Co., 546 Means Street, N.W., Atlanta, Ga., manufacturer of electrical equipment, parts, etc., will take bids soon on general contract for one-story plant on Northside Drive. Cost close to $40,000 with equipment. Robert & Co., Bona Allen Building, are architects and engineers.

Quartermaster, CCC, Fort Screven, Ga., asks bids until March 18 for three drill presses, three lathes, three jointers, three jig saws, three bench saws, motors and tools (Proposal 5409-22).

United States Engineer Office, Jacksonville, Fla., asks bids until March 8 for one cast steel flap valve, assembled and complete (Circular 211).

SOUTHWEST

Progressive Brass Co., 1702 East Sixth Street, Tulsa, Okla., manufacturer of brass and bronze products, has leased one-story building, 35 x 120 ft., to be erected on adjoining site by S. E. Vance, 607 South Boulder Street, and will occupy for expansion. General contract for superstructure has been let to Samuel Howard, Lee Hotel. Cost about $35,000 with equipment.

Evans Wallower Lead Co., Cardin, Okla., has plans for new one-story zinc concentrating plant at local works. Cost close to $100,000 with machinery. C. E. Stover is company engineer.

Brass & Copper Sales Co., 2817 Laclede Avenue, St. Louis, will take bids soon for one and two-story addition to plant, 25 x 130 ft., for storage and distribution. Cost over $50,000 with equipment. J. M. Cook, 736-A Manchester Avenue, is architect.

City Council, Goodland, Kan., will ask bids soon for new municipal electric power plant and distributing system. Bond issue of $200,000 has been authorized for project. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Seven-Up Bottling Co., 2337 Russell Boulevard, St. Louis, will ask bids soon on revised plans for two-story mechanical-bottling plant, 100 x 125 ft., with service and garage building for company motor trucks. Cost about $65,000 with equipment. Emil H. Niemann, 3816 Shaw Avenue, is architect.

Shell Petroleum Corp., Shell Building, St. Louis, has plans for new natural gasoline plant in gas field area of Moore County, near Amarillo, Tex., with power house, compressor station and other mechanical divisions, including steel tank storage and distributing facilities. Cost close to $100,000 with equipment. Sinclair Prairie Oil Co., Sinclair Building, Tulsa, Okla., is interested in project and will engage jointly in constructing and operating plant.

City Council, Electra, Tex., will ask bids soon for new municipal electric power

plant and equipment. Fund of $221,000 has been secured through Federal aid.

Humble Oil & Refining Co., Humble Building, Houston, Tex., has acquired property adjoining bulk oil storage and distributing plant at McKinney Avenue and Palmer Street for expansion, including new buildings, steel tanks and other equipment. Cost over $70,000.

SOUTH CENTRAL

Standard Oil Co. of Louisiana, Inc., St. Charles Avenue, New Orleans, has acquired about five-acre tract at Riverside Boulevard and Wisconsin Street, Memphis, Tenn., for new bulk oil storage and distributing plant, with steel tanks, pumping station and other equipment. Cost over $80,000 with equipment.

Penfield Co., Carew Tower Building, Cincinnati, has acquired plant and business of Bixler Distilling Co., Juniper Springs, Ky., for about $2,000,000 and will operate under name of Tim Bixler Distilling Co., Inc., an Ohio corporation. Plans are under way for expansion and improvements, including new buildings and equipment. Cost close to $300,000 with machinery.

United States Engineer Office, Louisville, asks bids until March 10 for repair parts for dredge, including liners, renewable vane, bolts, studs, screws, flanges, pipe, etc. (Circular 222).

Falstaff Brewing Corp., 3684 Forest Park Boulevard, St. Louis, has let general contract to Caldwell Brothers & Hart, 816 Howard Avenue, New Orleans, for three-story addition to branch brewery at 2600 Gravier Street, New Orleans, and improvements in present plant. Cost about $150,000 with equipment. Bendernagel & Cazale, 8 Marlborough Gate, New Orleans, are architects.

Allburn Mining Co., McCarr, Ky., plans rebuilding tipple and head-house at coal-mining properties recently destroyed by fire. Loss close to $30,000 with equipment.

Common Council, Opelousas, La., plans early call for bids for new electric generator and auxiliary equipment for municipal power plant. Cost about $75,000.

WESTERN PA. DIST.

Gulf Refining Co., Gulf Building, Pittsburgh, has acquired about 30-acre tract adjoining oil refinery at Toledo, Ohio, for expansions. Company engineering department will make surveys soon for new units, steel tank storage and distributing facilities, and other structures, with estimates of cost.

Bucyrus-Erie Co., 1202 West Twelfth Street, Erie, Pa., manufacturer of cranes, power shovels, draglines and other heavy machinery and parts, has let general contract to E. E. Austin & Son, 1919 Reed Street, for one-story addition, 100 x 150 ft. Cost over $50,000 with equipment. W. R. Eichert is general works superintendent.

W. H. Daugherty & Son Refining Co., Petrolia, Pa., has plans for rebuilding part of local oil refinery recently destroyed by fire, including new steel storage tanks and other facilities. Cost close to $60,000 with equipment. Main offices are at 88 Lexington Avenue, New York. Company is affiliated with L. Sonneborn Sons, Inc., last noted address.

OHIO AND INDIANA

McKay Machine Co., Lincoln Avenue, Youngstown, manufacturer of sheet, tin and strip mill machinery and parts, roller levelers, etc., has plans for expansion and improvements, including new one-story buildings, about 50 x 150 ft., and smaller. Cost close to $275,000 with equipment. Company is affiliated with Wean Engineering Co., Inc., Warren, Ohio.

Timms Spring Co., Taylor and Boston Streets, Elyria, Ohio, manufacturer of steel wire and springs, has asked bids on general contract for one-story addition, 60 x 200 ft. Cost over $75,000 with equipment. Silsbee & Smith, Turner Building, are architects.

Lippincott Co., 42 Main Street, Cincinnati, packer and food canner, has plans for new branch plant at Napoleon, Ohio, where property recently was acquired, to include power house and other mechanical structures. Cost about $125,000 with equipment.

Cliffside Brewing Co., 242 West McMicken Avenue, Cincinnati, has rejected bids recently received for three-story mechanical-bottling works, 96 x 120 ft. Revised plans are being drawn and new bids will be asked soon. Richard Griesser & Son, 64 West Randolph Street, Chicago, are architects.

Perfection Steel Body Co., Galion, Ohio, operating Perfection Burial Vault Co., same place, manufacturers of steel bodies for motor trucks and dump trucks, metallic caskets, etc., has plans for rebuilding plant destroyed by fire a few months ago, to occupy former site of shops of Erie Railroad Co. It will be one story, about 68,000 sq. ft. floor space. Company will also maintain a branch unit on Harding Way East, where structure is occupied, under lease, for manufacture of special dump truck bodies. Cost close to $250,000 with equipment.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until March 8 for propeller blades and propeller hubs (Circular 542), one 5-ton electric hoist (Circular 555), 300,000 electrical terminals (Circular 544), lamp assemblies and carrying cases (Circular 543); until March 9, steel cotter pins and taper pins (Circular 545), 24,500 wire cable thimbles and 600 cable clamps (Circular 546); until March 10, bolts, nuts and screws (Circular 548); until March 11, steel and brass wood screws (Circular 558), fastener assemblies and lift-the-dot fasteners (Circular 549).

Stokely Brothers & Co., 2002 South East Street, Indianapolis, manufacturer of canned foods, operating Van Camps, Inc., same address, food packer and canner, has acquired plant at Superior, Wis., and will remodel for new branch canning factory. Cost over $200,000 with machinery.

Contracting Officer, Quartermaster Corps, Jeffersonville, Ind., asks bids until March

8 for 4800 lb. horseshoe nails and about 46,000 lb. of animal shoes (Proposal 431-142); until March 9, 10,100 lb. horseshoe nails and 75,000 lb. animal shoes (Proposal 431-135).

MICHIGAN DISTRICT

Zenith Carburetor Co., 696 Hart Street, Detroit, manufacturer of carburetors, parts and kindred automobile equipment, has let general contract to Vincent & Strum, 4261 Kensington Avenue, for two-story addition, 25 x 120 ft. Cost close to $50,000 with equipment. Leonard Willeke, 16934 Village Lane, is architect.

Lonergan Mfg. Co., Michigan City, Ind., manufacturer of oil and water heaters, parts, etc., has acquired former plant of Kelsey-Hayes Wheel Co., Albion, Mich., and will improve for main works. Present plant will be removed to new location and capacity increased, with facilities for about 200 employees. Company is affiliated with Steelcraft, Inc., first noted place.

Huron Portland Cement Co., foot of Seventh Street, Muskegon, Mich., will make extensions and improvements, including construction of four cement elevator units. Cost about $75,000 with elevating, conveying and other mechanical equipment.

LeMaire Tool & Mfg. Co., South Telegraph Road, Dearborn, Mich., manufacturer of tools and kindred equipment, has plans for one-story unit, 84 x 90 ft. Cost about $40,000 with machinery.

Ford Motor Co., Dearborn, Mich., plans new works for manufacture of automobile parts near Ways, Ga., about 20 miles from Savannah, Ga., where site has been selected on Ogeechee River. Company will establish a new industrial community in that area, with dwellings for plant operatives, community house and other buildings. Entire project will cost over $800,000.

Fisher Body Corp., Pontiac, Mich., manufacturer of automobile bodies, has let general contract to J. A. Utley, 6031 Mansur Street, Detroit, for one-story addition. Cost close to $50,000 with equipment.

MIDDLE WEST

Constructing Quartermaster, Scott Field, Ill., asks bids until March 11 for one compressor unit with condenser receiver (Proposal 6626-6).

Louis Meskan Brass Foundry, 2902 Carroll Avenue, Chicago, has purchased about 38,000 sq. ft. on North Major Avenue, improved with one-story building, and will remodel for plant. Present works will be removed to new location early in spring and capacity increased.

Amalgamated Roofing Co., 6600 South Central Avenue, Chicago, has let general contract to McKeown Brothers Co., Civic Opera Building, for one-story addition. Cost close to $40,000 with equipment.

Theodore Hamm Brewing Co., St. Paul, Minn., has let general contract to William Baumeister Construction Co., Pioneer Building, for two-story and basement addition, primarily for storage and distribution. Cost about $60,000 with equipment. C. H. Johnston, Empire Building, is architect.

Bureau of Reclamation, Custom House, Denver, asks bids until March 8 for galvanized guy wire, motor starter, motor controllers, switches, etc. (Proposal A-42199-A); until March 19, three fixed wheel gates, 25 ft. 8 in. x 40 ft., with gate frames and metalwork for gate counterweights, for spillway at Alcova Dam, Casper-Alcova project, Wyo. (Specifications 726).

City Council, Hopkinton, Iowa, asks bids until March 15 for two diesel engine-generator units with accessories (Section 2), switchboard and auxiliary equipment (Section 3), and electrical distributing system (Section 4), for municipal electric power plant. A. S. Harrington, Baum Building, Omaha, Neb., is consulting engineer.

Rath Packing Co., Sycamore and Elm Streets, Waterloo, Iowa, meat packer, has asked bids on general contract for four-story addition, 100 x 110 ft. Cost over $100,000 with equipment. H. Peter Henschien, 59 East Van Buren Street, Chicago, is consulting engineer. John W. Rath is president.

McGraw Electric Co., 120 South LaSalle Street, Chicago, manufacturer of electric household appliances and equipment, plans new factory at Elgin, Ill. Cost over $50,000 with equipment. Olsen & Urbain, 228 North LaSalle Street, Chicago, are architects.

Kimberly-Clark Corp., Neenah, Wis., is considering bids opened Feb. 25 for construction of machine room, 133 x 183 ft., one and two stories, and warehouse addition, 86 x 254 ft., four stories and basement, designed by firm's engineering staff and estimated to cost $500,000.

Gudgeon-Wemmer Mfg. Co., Madison, Wis., has been organized with authorized capital of $100,000 to establish plant for production of water pumps and other automotive parts and equipment. Principals are S. A. Gudgeon, J. B. Wemmer and K. V. Eng, all of La Farge, Wis. Location in Madison will be determined soon.

Wausau, Wis., City Council has applied for PWA grant of $603,000 toward construction of sewerage system, sewage and garbage disposal plants and other municipal improvements, to cost about $1,340,000. Project is planned by Jerry Donohue Engineering Co., 608 North Eighth Street, Sheboygan, Wis.

PACIFIC COAST

E. I. duPont de Nemours & Co., Linden Avenue, South San Francisco, manufacturers of industrial chemicals, etc., have let general contract to Cahill Brothers, 206 Sansome Street, for one-story addition. Cost about $65,000 with equipment. Main offices of company are in Wilmington, Del. David G. Kennedy is plant manager at South San Francisco.

Western Barium Corp., Russ Building, San Francisco, has acquried about 50-acre tract of mineral lands at Rosamond, Cal., and plans new barium mining and refining plant. Cost over $50,000 with machinery.